

**THE
RAILWAY GAZETTE**

A Journal of Management, Engineering and Operation
INCORPORATING

Railway Engineer • TRANSPORT • The Railway News

The Railway Times • Herapath's Railway Journal • RAILWAY RECORD.

RAILWAYS • ESTABLISHED 1835 • THE RAILWAY OFFICIAL GAZETTE

PUBLISHED EVERY FRIDAY

33, TOTHILL STREET, WESTMINSTER, LONDON, S.W.1

Telegraphic Address: "TRAZETTE PARL., LONDON"
Telephone No.: WHITEHALL 9233 (8 lines)Annual subscription payable in advance and postage free
British Isles and Abroad £2 5s. 0d.
Single Copies One Shilling
Registered at the General Post Office, London, as a Newspaper

VOL. 82 No. 6

FRIDAY, FEBRUARY 9, 1945

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DIESEL RAILWAY TRACTION SUPPLEMENT

The February issue of THE RAILWAY GAZETTE Supplement, illustrating and describing developments in Diesel Railway Traction, is now ready, price 1s.

GOODS FOR EXPORT

The fact that goods made of raw materials in short supply owing to war conditions are advertised in this paper should not be taken as indicating that they are available for export

NOTICE TO SUBSCRIBERS

Consequent on the paper rationing, new subscribers cannot be accepted until further notice. Any applications will be put on a waiting list, and will be dealt with in rotation in replacement of subscribers who do not renew their subscriptions

POSTING "THE RAILWAY GAZETTE" OVERSEAS

We would remind our readers that there are many overseas countries to which it is not permissible for private individuals to send printed journals and newspapers. THE RAILWAY GAZETTE possesses the necessary permit and facilities for such dispatch.

We would emphasise that copies addressed to places in Great Britain should not be re-directed to places overseas

TO CALLERS AND TELEPHONERS

Until further notice our office hours are: Mondays to Fridays 9.30 a.m. till 5.30 p.m.

The office is closed on Saturdays

ANSWERS TO ENQUIRIES

By reason of staff shortage due to enlistment, we regret that it is no longer possible for us to answer enquiries involving research, or to supply dates when articles appeared in back numbers, either by telephone or by letter

ERRORS, PAPER, AND PRINTING

Owing to shortage of staff and altered printing arrangements due to the war, and less time available for proof reading, we ask our readers' indulgence for typographical and other errors they may observe from time to time, also for poorer paper and printing compared with pre-war standards

Advertising on Railways

IN the House of Lords on February 1 Lord Mottistone initiated a debate by suggesting that the Government should ensure that in all planning schemes adequate steps were taken to prevent the disfigurement of the neighbourhood by ugly signs or advertisements. There were many references to railway lineside advertisements; to the advertising of the railways Lord Mottistone paid a tribute because he said it was so entirely good. In their stations were the most eloquent posters showing original drawings and some reproductions from great artists, and they were very beautiful. He quoted a foreigner who had commented to him that among the most beautiful things in England were the railway companies' advertising posters, but that as soon as he went into the country, pursuant to their exhortations, he saw railway bridges covered with huge posters disfiguring the whole landscape. The contribution made to the improvement of art in pictorial advertising by Mr. Frank Pick was noted by Lord Latham. Not many of the Peers went so far as Lord Lang, who commented that he could hardly conceive any distraction, however ugly, in railway stations which would not be welcome in relieving the tedium of waiting for trains, although he stated that there were few things more admirable than railway advertisements in which the companies had employed first-rate artists.

Mr. C. G. Hodgson

Mr. Clement G. Hodgson, O.B.E., M.I.Mech.E., Consulting Engineer to the Sudan Government, whose death was recorded briefly in our December 29, 1944, issue, and of whom a portrait and biography appear on another page, was largely responsible for the development of the Mechanical Department of the Sudan Government Railways. He was in charge of that department for some seventeen years, during which the railway mileage was trebled, and its headquarters moved to Atbara, where large workshops for locomotives, carriages and wagons were established, and a railway township built. Between 1912 and 1918, also, many river steamers and harbour craft, as well as the dockyard, power station and quay machinery at Port Sudan, and the dockyard of the Steamers & Boats Department at Khartoum, were absorbed by the Railway Department; and thus a 2,100-mile system of river transport was added to the already much-enlarged railway. When Mr. Hodgson became Locomotive Superintendent, in 1904 (his title later was changed to that of Chief Mechanical Engineer), there was a mixed stock of locomotives in use. New engines were required, and he designed successful Mikado, Pacific, and Atlantic types, in which superheating and feed-water heating were in use. Before he left the Sudan in 1921, coach bodies were being built at Atbara, of a high standard of comfort and appearance, which well withstood the rigours of the climate.

British Investments in Brazilian Railways

The total amount of British investments in Brazil, as quoted on the London Stock Exchange at the end of 1944 was £229,147,252, on which interest of £8,892,252, or 3.8 per cent. was paid. The total receiving no interest was £21,760,126. The operation of the Brazilian debt scheme makes comparisons not strictly comparable but the similar figures at the end of 1943 were £237,765,849 for the amount outstanding, £5,779,628 equal to 2.4 per cent. for the interest received and £36,267,274 for the debt receiving no interest. There has been a welcome improvement in the statistics compiled by *The South American Journal* relating to investment in the railways of Brazil. For example, the total amount has declined by nearly £2,000,000 to £30,916,632, as a result partly of normal annual debenture redemptions, but more particularly to the fact that the debentures of the Sorocabana Railway and the Southern San Paulo Railway were redeemed last October. As both issues were in the non-dividend paying group, the average return on this section has advanced, and the Leopoldina Railway has paid two years' arrears of interest on its 4 per cent. first debenture stock. The outcome has been that the average return has advanced from 1.5 per cent. to 2.1 per cent. The capital receiving no return is now £17,638,536, which compares with £19,843,920 at the end of 1943.

Road Transport Industrial Council

To mark the silver jubilee of the National Joint Industrial Council for the Road Passenger Transport Industry, a luncheon was arranged for February 8, but we closed for press before its occurrence. The subject is of particular interest as it commemorates many successful years of national industrial negotiating machinery in transport. It was on September 5, 1919, that the National Joint Industrial Council for the Tramway Industry (representing both municipalities and companies) was inaugurated, and it continued in that form until 1937, when the com-

panies withdrew and the municipal undertakings continued under the present name of the National Joint Industrial Council for the Road Passenger Transport Industry. The Council was formed as a result of the publication in 1917 of a Report prepared by a committee under the chairmanship of the Rt.-Hon. J. W. Whitley, then Speaker of the House of Commons, to whom the industrial world is indebted for the foundation of what became known as Whitley Councils. Between 1918 and December, 1921, no fewer than 73 councils were established, and the total is now about 100. The constitution of the Council was altered in 1932, so as to include trolleybus employees within its scope. After 25 years, the Council is responsible for the well-being of 71,000 employees and their dependents and watches the interests of 95 constituent undertakings with an annual revenue (in 1939) of more than £31,000,000. The present war has provided a great many new difficulties such as the transference of labour, the Essential Work Orders, and payment when work is dislocated by air raids, but so far these have all been overcome successfully. Donations exceeding £1,000 have been received from the Canadian Transit Association for disbursement to employees of British transport undertakings injured as a result of the war.

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The G.W.R. South Wales Docks

Some interesting and relatively up-to-date statistics concerning the traffic of the principal South Wales ports is given in a booklet just published by the Great Western Railway Company, and to which reference is made under Publications Received. The magnitude of the trade may be judged from the fact that since the last war, in one year 24,000 vessels visited the principal South Wales ports, and the total traffic dealt with was 44½ million tons, of which 35½ million tons was coal shipped. During the depression traffics fell substantially and the annual total tonnage in the five years before the war averaged just over 25 million tons, of which 19½ million tons was coal shipped and 5½ million tons was of other exports and imports. During the war the quantities of traffics classed under "General Merchandise" have been nearly five times as great as before the war; the total of general merchandise imported and exported at the South Wales docks for the last complete year before the war was 592,000 tons, whereas for 1943 it was 2,935,000 tons. The wages paid by the G.W.R. for the operating work only of the principal docks was £2,500,000 in 1943, to which has to be added £800,000 paid by private stevedores to transport workers.

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The Future of Merseyside: More Planning

What has been described as an unique civic adventure was the Merseyside Civic Competition which was organised by the Merseyside Civic Society in association with the *Liverpool Daily Post*. It had two objectives, namely, to invite new and practical suggestions for improving the amenities of Merseyside, and to ascertain the views of Merseyside people as to the improvements they want. This was the first time that the population of such a vast and important area had been given the opportunity of putting forward suggestions for local post-war development, and the competition has attracted the attention of both national and local authorities. The results have now been published in a booklet edited by Mr. James R. Spencer.* The majority of the suggestions come under the two main headings of housing and road transport; in the latter sphere the suggestion most strongly supported in the competition was the formation of a Merseyside Passenger Transport Board. Railway suggestions included improved transport between railway terminals in Liverpool; increased electrification of suburban lines; and the examination of a scheme for main-line railway services from Liverpool to North Wales via the Mersey Railway tunnel and a Dee Causeway. A single main-line station for Liverpool was regarded as impracticable and undesirable. Various competitors said they had knowledge that the railway companies were actively considering inter-station transport in Liverpool, and further suburban electrification.

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Wartime Travel in Switzerland

The one European country in which passenger train services have shown little deterioration as a result of war conditions, and in some respects, indeed, have improved, is Switzerland. All through international trains have been withdrawn, but over many important routes their place has been more than filled by the new *trains directs legers*, or lightweight high-speed trains, which have been introduced on several new itineraries during the war period. The first of these services, which began to operate in pre-war days between Geneva, Lausanne, Berne, and Zurich, is now expanded to three trains in each direction daily, normally

made up to six streamline coaches, including buffet-bar, but increased at times of pressure to as many as ten vehicles. No more than 10 min. has been added to the original timings; the overall allowance is now 3 hr. 40 min. for the 179 miles between Geneva and Zurich. The similar pre-war service between Geneva, Lausanne, Neuchatel, Bienne, and Basle still continues, twice daily in each direction. New routes for *trains directs legers*, since the war began, are between both Basle and Zurich and Lugano, by the Gotthard route, and, in the east of Switzerland, between Rorschach, on the Lake of Constance, and Chur, capital of the Grisons and terminus of the Rhaetian Railways. There are connecting fast services by the subsidiary lines, as, for example, between Berne and Lucerne. The "Red Arrow" high-speed railcars are also being used, with trailers attached, to provide fast services on various subsidiary and branch lines.

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Protection against Wave-Action

Extensive protection works against wave-action were recently carried out where a double-line section of the Pere Marquette Railway runs for half a mile along the shore of Lake Michigan on an 80-ft. embankment. They consisted mainly of (1) a boulder-backed row of steel sheet piling or of 8-gauge interlocking steel corrugated sheeting, extending for 3,000 ft. along and at the toe of the bank; (2) a 4,200-ft. line of ¾-in. steel sheet-piling driven in the water about 60 ft. from and parallel to the toe of the bank; (3) nine jetties acting as breakwaters, and (4) subsidiary revetment works. The outer line of sheet-piling was tied back with old box-car tie rodding to a line of timber piles 13 ft. 4 in. to shoreward, which in turn was similarly tied back to a second line of piles a further 20 ft. shoreward; the outer piles were driven 4 ft. apart and the inner line 12 ft. apart. Boulder pitching was brought by train, dumped down the embankment and distributed by a service railway along the foreshore. The trucks of stone were lifted bodily with a crane and their contents discharged at the spot required to provide filling between the two rows of sheet-piling. The breakwater jetties consisted of a walling of double rows of piles with heavy boulders between them and a hearting of 15-in. x 15-in. x 3 ft. concrete blocks. On the landward side storm-water cascading from a 30-ft. bluff was diverted from the formation by a line of 8-gauge corrugated sheeting driven into the ground 5 ft. 6 in. and extending over a length of 3,650 ft. Beyond this a ditch carried the water to seven concrete sumps.

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Preparing for 100 m.p.h. Speeds

It seems to be clearly realised by railways that high-speed schedules will be a *sine qua non* in post-war passenger travel. One American transcontinental railway, for example, has stated that it contemplates the resumption of a programme of track strengthening, realignment, and refinement which will ultimately permit speeds of from 100 to 125 m.p.h. on the journey of 2,200 to 2,300 miles between Chicago and the Pacific Coast. Another United States system plans extensive roadbed, track improvement, and curve reduction work affecting at least 500 miles of line. Ancillary to this work on track will be further installation of centralised traffic control and cab signalling, lengthening of passing sidings and increase in their number, provision of switch point-locks on all high-speed switches and elimination of facing-points wherever possible, acceleration of the work of substituting bridges for level crossings and increased safety precautions at the crossings that remain, and adequate warning devices against the effect of floods, washouts, landslides and rock falls. All this work will be additional to the overtaking of arrears of maintenance. In the years 1941 to 1943 inclusive, American railways between them spent \$2,506,000,000 on maintenance, an annual average of \$835,460,000, and thus expenditure rose to an all-time high level of \$1,106,870,000 in 1943. Nevertheless the cost of maintenance of way and structures is still rising; in the first eight months of 1944 no less than \$828,916,000 was expended in the United States in this way, as compared with \$679,432,000 and \$500,723,000 respectively in the same months of 1943 and 1942.

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Pennsylvania Sleeping Car Services

As foreshadowed in an editorial article in our December 1 issue, the Pennsylvania Railroad is now taking active steps to implement the decision to own, staff, and operate its own sleeping car service in future, as a result of the relinquishment by Pullman Incorporated of the car operating side of its business. The President of the Pennsylvania has written to the President of Pullman Incorporated, calling on the latter company to fulfil its contractual obligations concerning the sale of sleeping cars to the Pennsylvania, under the terms of an agreement entered into between the two companies on January 1, 1936. The Pennsylvania has also indicated that it may desire to negotiate the

* Merseyside of the Future: An Analysis of 10,000 Ideas. Liverpool, Daily Post & Echo Limited. 8½ in. x 5½ in. 78 pp. Price 2s. 6d.

purchase of additional second-hand cars now owned by Pullman, in accordance with the final judgment of the Federal District Court directing the separation of the two Pullman companies, which contained provisions for the sale of the Pullman sleeping car stock. A copy of this Pennsylvania letter has been filed in the Federal Court at Philadelphia, and the railway has requested that Pullman Incorporated, in its final separation plan to be submitted to the District Court, will provide for the sale to the Pennsylvania Railroad of the equipment required.

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Dwarf-Type Running Colour Lights

In this country until comparatively recently a broad distinction has been made between ordinary running signals and so-called ground signals and the latter used to control shunting movements. It is true that signals governing subsidiary movements were and frequently are seen on posts—ground discs are sometimes so fixed—and that in tunnels even running signals have to be fixed to the ground, but nevertheless the broad distinction mentioned has been thought of as ruling. In an endeavour to eliminate expensive brackets and gantries when installing colour-light distants in replacement of semaphores due for renewal the L.M.S.R., as illustrated in our issue of December 24, 1943, has adopted, where conditions are suitable, dwarf type signals of this pattern for main running movements, and the Locomotive Running Department has expressed itself quite satisfied with the arrangement. The L.N.E.R. also now has some signals of this kind in trial service near London, with the object of achieving a like result, and by courtesy of Mr. J. C. L. Train, Chief Engineer, we illustrate them on page 137. If such low height signals are to become used to any extent the desirability of eliminating colours from ground shunts—at least those of the light type—will become correspondingly apparent, so as to leave colour-light aspects to be read solely as running indications.

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75 Years of Air Brakes

In 1944 there was a celebration in the United States of the seventy-fifth anniversary of the invention by George Westinghouse of the railway air brake in 1869. The evolution of the straight air brake was soon followed by that of the automatic air brake three years later, and since then many further improvements and developments have taken place designed to meet the demands made by greatly increased loads and speeds. In this connection it is striking to recall that as far back as 1913 the "UC" passenger brake patents incorporated provision for control of the pneumatic brake by electrical means, but that the performance of the air-brake alone was so satisfactory, in the traffic conditions of that time and subsequently, that the electric assistance was not deemed to be necessary, except in New York subway operation. It was not until the high-speed streamline trains began to run, ten years ago, that electric control features, producing instantaneous response to control impulses on every vehicle of a long train, came into use in the "HSC" brake. It is claimed that for 48 years George Westinghouse took out a new patent, on the average, every six weeks, and his associate, Walter V. Turner, who joined him in 1903, was responsible for 400 patents of electrical, mechanical, and pneumatic inventions.

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Locomotive Mileages in U.S.A.

With the introduction of larger and larger motive power units in the United States, the average mileages attained per locomotive are rising rapidly, and in this matter the modern steam locomotive is proving a close competitor of the diesel. A present-day 4-8-4, weighing with its tender nearly 400 tons, exerting a tractive effort of 70,000 lb., mounted on a cast-steel frame, and equipped throughout with roller bearings, can operate for more than 1,000 miles without replenishment of lubricating oil reservoirs, and for over 500 miles without attention to the roller-bearing lubrication. Such locomotives can average more than 400 miles daily without being out of service for more than one day in sixteen; they can run over 2,000 miles without fire-cleaning; and with the help of tenders holding 25 tons of coal and 25,000 gal. of water, they can cover most locomotive divisions—200 miles or so—without taking coal or water. A group of 4-8-4 locomotives on one American railway has averaged 238,000 miles each between heavy repairs, and an average of at least 175,000 miles is general. As showing the advance that has been made in recent years, during 1943 each unit of the entire passenger locomotive stock of the Atchison, Topeka & Santa Fe Railway averaged 324 miles daily, the freight locomotives 147 miles, and the shunting locomotives 95 miles. The Union Pacific did nearly as well, with 322, 144, and 94 miles respectively. Thirteen railways in all could show a daily average of over 175 miles with all passenger locomotives, and over 100 miles with all freight locomotives.

Indo-Burma Railway Connection

COMMUNICATIONS of the Assam-Burma front are so closely associated with the sixty-year-old and frequently recurring Indo-Burma Railway project, that some notes on the latter may not be out of place. Reference is invited to the map on page 136. Before its separation from India, Burma was the largest province in the Indian Empire, but it was isolated from the Peninsula by a barrier of wild mountain country and by the Bay of Bengal. A thrice-weekly service of fast steamers linked Rangoon with Calcutta, and there was also a weekly service to and from Madras. So roundabout and so costly to construct is any railway to connect Calcutta or the other great cities of India with Burma, that it cannot be justified financially on normal peacetime grounds, especially as any route followed by such a line would traverse long sections of almost uninhabited country, which, because of its rugged topography, is not likely to provide appreciable local traffic. The railways of Assam and Burma are all of metre gauge, as are those of Yunnan (China), Siam, and the Malay States, Burma's other neighbours, so that this is obviously the gauge best suited to an Indo-Burma connection. From almost the whole of India to Rangoon, or even to Mandalay, mails and passengers can be carried more expeditiously by the direct sea routes than they could by a circuitous metre-gauge railway, the gradients and curves of which necessarily would be such as to curtail speeds severely.

Despite numerous reconnaissances and surveys carried out during the past 60 years, therefore, Burma has hitherto remained isolated from India by land, as there was not even a road connecting them before this war. When, however, the German cruiser *Emden* roamed the Bay of Bengal at will in 1914, and caused all sea communications with Burma to be suspended, the need for a land link was seriously considered. After the Indo-Burma survey of 1914-15, the matter was again allowed to drop at the end of the latter year, as there was no further threat to the sea routes. It was not until the Japanese, advancing through Burma, threatened to invade India in 1942, that direct land communication really became an urgent need.

There are three general routes by which a railway can be built from India to Burma:—

(1) The coast route from Chittagong, in Eastern Bengal, down the Arakan coast and thence by one of several feasible passes through the Arakan Yoma ("Great Spinal Ridge") to Central or Southern Burma. This is the shortest and best land route from Calcutta to Rangoon;

(2) The Manipur route from either Dimapur or Silchar, on the Assam-Bengal section of the Bengal & Assam Railway, via Imphal to the centre of the Mandalay—Myitkyina section of the Burma Railways. It provides the most direct route from the populous provinces of Northern India to Upper Burma; and

(3) The Hukawng Valley route from Ledo, in northern Assam to the northernmost section of the Mandalay—Myitkyina railway, the shortest and cheapest line from the viewpoint of new construction, but having the poorest local traffic prospects.

So far as we are aware, the earliest record of any serious investigation for an Indo-Burma railway is contained in a report dated 1884. The map accompanying it shows as *proposed* the now-existing Bengal & Assam Railway from Santahar to Tinsukia, the Dibru-Sadiya Railway thence to Ledo, and a connection through the Hukawng Valley from Ledo to Mogaung, now on the Mandalay—Myitkyina railway. Moreover, this map shows the principal railways subsequently built in Burma, including an extension from Lashio to Yunnan-fu (now known as Kunming)—in fact, the Sino-Burma railway at present under construction. During the field-season 1894-95, four engineers under Mr. R. A. Way reconnoitred the Manipur route, and, after careful examination, prepared rough estimates of subsequent construction costs. In the next year the same engineers undertook a similar reconnaissance of the Hukawng Valley route.

It was not until 1903-04 that the first detailed survey was undertaken, under Mr. A. R. Lilley, for a line from Prome, a railroad in Lower Burma, westwards to Taunggyi, the southernmost and lowest feasible pass in the Arakan Yoma. Five years later, four parties under Mr. G. Richards surveyed a continuation of this route from the Taunggyi pass along the Arakan coast to Chittagong. A second coastal route via the An Pass was surveyed in detail in 1914-15, again by four parties under Mr. Richards. This route, by cutting across the Yoma considerably farther north than Taunggyi, gives more direct communication with central Burma, via Minbu, Magwe, and Pynmana, on the Rangoon—Mandalay main line.

Finally, the Hukawng Valley route was surveyed in detail by

Mr. Allum in 1919-21, after a preliminary reconnaissance by Mr. G. H. Stevenson in 1917 had examined the passes of the Patkai range, which separates Assam from Northern Burma. The alignment then selected, though not exactly followed by the Ledo-Burma road and pipeline, is never very far from them.

The surveys over the Yoma and by the Hukawng Valley were extremely difficult, because of the mountainous country and dense jungle. On the last-named route, hostile tribes and lack of transport further complicated matters. The only construction so far carried out is the 25 miles southwards from Chittagong, on the coastal route, opened for traffic in 1930.

Now that a good two-way road has been completed from Ledo to Myitkyina, the construction of a railway by the Hukawng route would be greatly assisted. In fact, from all points of view, construction by this route seems to be the most likely, if an Indo-Burma railway is ever to be built. Its best chances appear to be as part of a through rail route from India to China and to Siam and Malaya, *via* Burma, especially if it has the backing of the Chinese Government.

The Passing of the Company-Managed Railways of India

AT the time of the 1914-18 war there were two major Indian railways under direct State control and management. During 1925 two other railways, the East Indian and the Great Indian Peninsula, passed from company to State control. The present war has seen the six remaining major Indian railway systems which hitherto had been under the management of English companies, pass to State control. These recent additions to State control, however, have not been so much a wartime measure as the fulfilment of the policy of the Government of India which was declared before the war. Doubtless the acquisition of the companies' interests in these State-owned railways has been facilitated by the sterling credit balance accumulated during the war by the Government of India and the desirability of utilising this balance may have influenced the decision to terminate prematurely by negotiation certain of the contracts not due to terminate for some time to come. These additions double the mileage under direct State control as shown below:—

Railway system	Mean mileage previously under		Total mileage now under State control
	Company control	State control	
Assam Bengal	1,306	—	1,306
Bengal Nagpur	3,468	—	3,468
Bombay, Baroda & Central India	3,407	—	3,407
Bengal & North Western	2,740	—	2,740
Madras & Southern Mahratta	2,946	—	2,946
South Indian	2,487	—	2,487
Eastern Bengal	—	2,152	2,152
East Indian	—	4,218	4,218
Great Indian Peninsula	—	3,581	3,581
North Western	—	6,923	6,923
	16,354	16,874	33,228

Since 1942, the 90 route miles comprising the Dibru-Sadiya Railway, as a wartime measure, have been operated as part of the Bengal-Assam Railway, and proposals for the purchase of this system by the Government of India were recently approved by the stockholders of the Assam Railways & Trading Co. Ltd.

Under the convention as to the separation of State Railway finances from the general finances of the Central Government of India, railways are to be operated as a commercial undertaking. The magnitude of this undertaking now under one central control is illustrated by the figures below relating to the financial year 1942-43:—

	Rupees (Crores)	Sterling equivalent at 1s. 6d. per rupee
Capital at charge	773	580,000,000
Gross revenue	159	119,000,000
Working expenses	86	64,500,000
Interest charges	28	21,000,000
Number of employees		750,854

The control devolves on the Railway Department (Railway Board), Government of India, which takes the place of the London boards of directors of the company-managed railways. The Railway Board comprises the Chief Commissioner, Financial Commissioner, and two members (Transportation and Establishment), but recently has been strengthened by the addition of a member to deal with the problems of post-war reconstruction. The ultimate responsibility rests with the Member for War Transport in the Viceroy's Executive Council, who presents the Railway Budget to the Central Legislature.

The railways recently transferred from company to State con-

trol have so far retained their old identity, except the Assam-Bengal which is combined with the Eastern-Bengal; the joint undertaking is designated the Bengal-Assam Railway, and the Bengal-North Western Railway has been re-named the Oudh & Tirhut. It must be expected that further changes will occur now that all the railways of British India are under one central control, and these changes will doubtless be watched with interest by the railway world.

National Pool of Transport Tracks?

AFTER defining communications as "the highways, railways, and waterways, which provide the fixed ways of movement of persons and things from place to place," Mr. Frederick Smith, in a paper read on January 30 before the Swindon Economics Society, went on to suggest the establishment of a Communications Fund, administered by a State Communications Board. He puts this suggestion forward as part of a solution of the costs-and-charges difficulties which arise in the formulation of a common rates structure for railway and road operators. His scheme envisaged that our system of communications should be taken over by the State and integrated administratively and financially into one complete unit. Into the Communications Fund would be paid rents for the lease of the fixed tracks, and out of it would be paid maintenance costs, capital expenditure, and so forth. Where there was exclusive use of a fixed track, or where it required separate management, as in the case of the railways, the operating companies would lease the tracks from the Communications Board; the rental would be below the cost of servicing the capital by a substantial amount intended to represent (a) the community value of the property, and (b) properties not necessary for commercial purposes, such as lines kept open for strategic or communal purposes.

The costs of maintenance of the system of communications as a whole would be recoverable by a fixed levy per ton-mile in respect of traffic carried. In the case of road transport, exclusively motor roads probably would necessitate a special levy on motor traffic alone, but roads in general community use would require a levy on a basis similar to, but higher than, at present, and on a higher scale still for traders' vehicles. Where motor vehicles were exclusively used to serve traffic to or from railway, canal, or coastwise terminals, there would be no levy on the road portion of the transit, so as to encourage the use of each line of communication in its proper sphere.

Mr. Smith argued that the result of his suggestions would be to remove the pressure on owners of fixed track to put every ounce of traffic over it, so as to service the capital value of the track. He claimed, too, that it would lead to the concentration of railway loads at a limited number of points by road vehicles. This is a matter Mr. Smith has long urged. In his latest paper he again pointed to the fact that in 1938 the average freight train load was under 125 tons and the average train miles per train engine hour was 9.15. On the basis that on the average at least 15,000 net ton miles per engine hour was well within the physical capacity of the locomotive, the key to the railway problem was the raising of the general average payload of trains to 500 tons or over and the overall speed to 30 m.p.h. or over.

The Locomotive of the Future

THE unparalleled development of the railway locomotive in the United States, especially in the direction of technical mastery of the design problems posed by American operating conditions, is perhaps not so widely appreciated in this country as it should be. Nevertheless it represents a very remarkable achievement—or series of achievements—for the story is one of continual gradual improvements, of innumerable trials and experiments, each carefully assessed on the balance of its merits and drawbacks, before its general adoption or abandonment. By this acknowledgment of American progress in locomotive engineering, we do not in any way belittle what has been done in this country; there are, however, several basic differences between British and American practice which have a profound influence on the way in which each significant development takes place. But this is certain—British locomotive engineers, although having nothing to fear as to the fundamental suitability of their own designs, could benefit greatly by according a closer study to American practice than has been customary in the past.

At least three locomotive superintendents of days gone by were particularly interested in American locomotive features, and two of them even showed rather more than a trace of

American influence in their designs. Thomas W. Worsdell, previously to his brief "whirlwind" passage through the Stratford Works of the Great Eastern Railway (1882-85), *en route* for the North Eastern, had been Works Manager of the Pennsylvania Railroad works at Altoona; William Adams, who incidentally was also at Stratford during 1873-79, before he left for the London & South Western, produced some extremely interesting outside cylinder designs, notably the first English 2-6-0s, which had a strongly American flavour; and, much more recently, we have G. J. Churchward's highly individual types on the Great Western. It is, indeed, regrettable that the only American locomotives of recent years that could be observed in this country—the wartime "austerity" 2-8-0s—were not better specimens of modern U.S. practice, although the most unimaginative would appreciate the limitations under which the builders laboured.

There is, then, a very good case for the observation in this country, of American trends in locomotive design and operation. That being so, it is a matter of particular interest when such an authority as Mr. Ralph K. Johnson, the Chief Engineer of the Baldwin Locomotive Works, sums up the present outlook and attempts a forecast of developments. This he does in a paper presented before the Pittsburgh Railway Club on September 28, 1944, an abstract of which is published elsewhere in this issue. Mr. Johnson has already given locomotive engineers the benefit of his technical experience in his book "The Steam Locomotive" which is undoubtedly one of the most masterly textbooks of its kind, and which has attracted considerable attention in this country.

Mr. Johnson's present commentary, as he reviews the motive power situation, is of considerable importance. Although with very correct impartiality he covers electric and diesel locomotives in his survey, one feels that he is happiest when dealing with the steam locomotive. He pulverises those whose strictures on steam power are based on prejudice and superficial knowledge; "I cannot refrain," he thunders, "from making a few general remarks in reply to those who point with scorn to this type of power as 'obsolete' and 'backward.' The main criticism is that locomotives of today are reciprocating non-condensing types of 6-8 per cent. thermal efficiency, rather than high-pressure high-temperature turbine-condensing locomotives of up to 20 per cent. thermal efficiency. The implication is that designers have not troubled themselves to achieve higher efficiencies, whereas nothing could be further from the truth." Mr. Johnson then proceeds to the central argument of his thesis. Thermal efficiency alone is an insufficient criterion of the prac-

tical success of a steam locomotive. In striving after higher thermal efficiency, one may be tempted to employ devices which nullify the benefit they are supposed to confer, by sending up operating and maintenance costs, by increasing the capital charges, or by unreliable performance. "And most important of all, at least in the United States," says Mr. Johnson, "is the fact that fuel is cheap and railroads are not so interested in saving a few tons of coal as they are in getting the maximum power in a given weight and space."

He dwells on the unrivalled performance of the locomotive boiler as a steam-generating unit, in relation to its size. For the same output, a normal design of boiler for a power station would require vastly greater space and weight of materials. The Stephensonian locomotive survives because it meets requirements better than the numerous attempts to improve on it. The blast pipe has a beautiful simplicity, in controlling the draught; it is automatic, and is so simple and cheap that forced or induced draught fans simply cannot compete with it economically, as yet.

Mr. Johnson has a good word to say for the poppet valve as compared with the piston valve for steam distribution; he gives a useful list of locomotive details in which progress has been, and will be, made; and he also discusses the possibility of high pressures (350-600 lb. per sq. in.). He regards 350 lb. per sq. in. as the limit for normal locomotive boilers; and when existing regulations are revised, he sees in welded locomotive boilers a sure means of reducing the cost of repairs. The "duplex" locomotive (for example, a four-cylinder 4-4-4-4 type) is a useful alternative to a two-cylinder 4-8-4, and offers an elegant solution to the problems arising from the massive reciprocating parts for two big cylinders. Finally, on the subject of availability, Mr. Johnson makes some penetrating observations. Comparing diesel and steam locomotives, he remarks that the diesel sells itself primarily on account of its high availability. As a fact, however, users are forced by its high cost to keep it running. "No expense is too great to improve its productive time . . . but if the same interest in keeping steam locomotives moving was exhibited, a surprising increase in availability would ensue." Mr. Johnson concludes with some revealing records with modern steam power; he cites, among other examples, some 4-6-4s on the Chicago, Milwaukee, St. Paul & Pacific Railroad which made 10 complete round trips of 1,839 miles in 30 days, averaging 613 miles a day, with no special attention. This is far above average American operating results, but it shows what can be done, and is being done, on certain progressive lines.

LETTERS TO THE EDITOR

(The Editor is not responsible for the opinions of correspondents)

Railway Improvements Suggested

10, Oaston Road, Nuneaton,
Warwickshire. January 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—I notice when scanning the pages of your interesting journal, *The Railway Gazette*, at L.M.S.R. hostels, criticism of British railways and also obvious excuses in reply to such criticism. Let me state we do not win the warm regard and esteem of the travelling public by paltry excuses. We must face facts.

In this direction, I cannot but lay much emphasis on the need today for more expansive facilities in respect to the running track. To regulate trains efficiently, one must not only have ample crossover roads for diversion requirements, but always in one's mind, without reference to charts, actual knowledge as to whether diversion movements at wanted points can or cannot be undertaken. British railways, from my own knowledge, have stood still in this primary essential of efficient rail transport.

We do not buy land, or build houses on land, until we are perfectly satisfied we can expect suitable remuneration from any plan we launch for development. On the railways of Great Britain I suggest: (1) a much greater development in running track facilities; (2) a very much longer standard length of platform; and (3) a definite move towards colour and effect, brighter engines, brighter coaches, brighter and smarter uniform. Drab colours like L.M.S.R. standard browns do not attract by themselves, but have from time to time to be reinforced by excuses the staff so readily make.

In conclusion I want to see a definite ending to a silly old-fashioned notion. Freight trains travelling very closely behind one another under permissive regulations are conforming to what

we all want to see, full speed ahead. Permissive regulations can be held valuable only as a temporary expedient under abnormal conditions. With gigantic air competition in the offing, we must plan on absolute block certain lines.

Yours truly,
G. T. MUNDAY

A U.S.A. Railway Merger

Clacton-on-Sea. January 30

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The editorial on page 78 of your January 26 issue shows how America, with all its instinct for getting things done with dispatch, has lagged behind Great Britain in the matter of railway amalgamation. More than 20 years ago the Interstate Commerce Commission drew up a plan for consolidating the railways into 19 groups. The Atlantic Coast Line-Louisville & Nashville group was to include the Florida East Coast and was to be one of three amalgamated systems serving a huge territory, roughly square in shape, bounded on the north by a line through Richmond, Cincinnati and St. Louis, and stretching from the Mississippi to the Atlantic. The merger now proposed would give effect to a fractional part of the I.C.C.'s plan and would place the through route from Richmond to Key West under one control. There would be an end-on union on the same principle as was adopted in building up the L.N.E.R. East Coast route from Kings Cross to Lossiemouth.

The Seaboard Air Line would not have a strong case in opposing the merger. In spite of its name, the Seaboard is largely an inland railway running as far west as Birmingham in Alabama. The I.C.C. contemplated a fusion of the Seaboard with the Illinois Central whose main line runs direct from Chicago to New Orleans. The first 250 miles south of Chicago are outside the square of territory served by the Atlantic Coast Line group and the Illinois also has lines from Chicago to Sioux City and Omaha which lie in a different competitive area west of the Mississippi, but far away to the south-east it reaches Savannah

on the Atlantic shore through its control of the Central of Georgia railway. Operating over 6,500 miles of line, the Illinois Central would be the predominant partner in the second group.

The third group would be formed round the Southern Railway. Starting at Washington, its lines would run diagonally across the square from Richmond to New Orleans and from St. Louis to Jacksonville and would also reach Cincinnati in the north. All three groups would compete at a large number of important centres and two of them would share the traffic at many other places. The idea behind the I.C.C.'s plan was to cut out wasteful competition and to reduce operating expenses, but at the same time to preserve rivalry between strong railway combines. A map of the U.S.A. railways reveals the difficulty of giving effect to this theory. The large railways are unwieldy and can seldom be fitted readily into compact entities like our Great Western and Southern companies. The lines of the Illinois outside of the territory proper to its group are not, like the West Highland line of the L.N.E.R., loose limbs serving country studded with picturesque mountains and lochs, but yielding a sparse traffic. Chicago is the headquarters of the railway and perhaps the greatest hub of transport energy in the States. Abnormalities of a similar kind attend other consolidation schemes and have no doubt slowed up the process of welding the lines together. Then the principle of amalgamation seems to many Americans to run counter to their anti-trust laws, though these do not prevent the existence of numerous subsidiary companies so that some of the great railways like the Pennsylvania practically constitute a group already. The whole question of railway amalgamation makes an interesting study and it is unusual for this country to be 21 years ahead of America in one phase of railway development.

Yours faithfully,
R. BELL

Rotary-Cam Poppet Valve Gear

H.M.S. Osprey, c/o G.P.O.,
London. January 28

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—In the current number of your associated publication, *The Railway Magazine*, there is a note from a Mr. G. Shuttleworth eulogising the South African Railways' light 4-8-2 locomotives of class "19C" fitted with rotary-cam poppet valve gear.

Your contemporary, *The Locomotive Magazine*, in an article published in May, 1944, also gave a glowing account of the performance of these engines, and attributed the bulk of their success to the rotary-cam valve gear. Mention was also made that the Federated Malay States Railways had found that the same gear fitted to their engines had proved efficient and easy to maintain; in this case the cost of maintenance was given as 306s. (Straits) per annum, as against 528s. (Straits) per annum for comparative Walschaert-fitted engines.

But in *The Locomotive* for October last there appeared an authoritative douche of cold water in the form of a letter from Mr. M. M. Loubser, C.M.E. of the South African Railways. In no uncertain terms he quotes comparisons made between the "19C" class and the "19D" class engines fitted with Walschaert gear and piston valves. Results of dynamometer trials showed that the Walschaert engines used 10-11 per cent. less

steam than the R.C. engines, of which 6-8 per cent. could be attributed to the engine, as distinct from overall engine and boiler efficiency. Detailed maintenance cost figures are given showing in each case a marked saving (on a pence per mile basis) in favour of the Walschaert engine.

During the last six years it has been my good fortune to travel on locomotive footplates in many countries, and I have travelled on both the "19C" and "19D" class engines in South Africa and on the "O" class engines in the Federated Malay States, where the locomotive duties are not so very different from those in South Africa. As a mere observer, I would say that more freedom when coasting was the main item in favour of the poppet valve engines, but that on most of my trips on these engines, sticking valves were experienced. When the valve "un-sticks" the noise is like a young bomb detonating at the front end!

On the relative merits of poppet or piston valves, enginemakers vary in their opinions as much as most C.M.E.s. seem to do, although in this country, apart from the L.N.E.R., the poppet valve seems to be dead in locomotive practice. In America the Pennsylvania RR. is still experimenting, though most other companies—notably the Delaware & Hudson—have decided in favour of piston valves. When I was in India, some engines had recently been fitted with poppet valves and others of similar types had been re-converted to piston valves.

In theory the poppet valve appears almost ideal, and to the many interested (and, I hope, intelligent) "railwayacs" such as myself, there is so much in practice that appears contradictory.

Is it too much to hope that some day some unimpeachable authority, with a wide practical experience of both types of steam distribution, will write an exhaustive treatise on the subject?

Yours etc.,
P. RANSOME-WALLIS,
Surgeon Lieut. Commander, R.N.V.R.

Open-Vestibule Corridor Stock

12, St. John's Park,
S.E.3. January 29

TO THE EDITOR OF THE RAILWAY GAZETTE

SIR,—The paragraph in your January 26 issue on "open vestibule passenger stock" recalls to my mind an L.N.E.R. vehicle of around 1928 (then working as a third-class restaurant-car on the 12.15 p.m. from Marylebone, though its principle was equally suitable for all "vestibule" or centre corridor stocks) where, instead of the usual tables for four on each side of the centre corridor, tables were provided for two and six passengers. This retained the "single" seats, which are greatly appreciated by passengers, without decreasing the seating capacity of the vehicle, and also gave family parties of more than four the chance of sitting together, as in a side-corridor compartment.

There is the further advantage in normal times, where the third class accommodation is not always taxed to its maximum, that whereas the tables designed for four do not always seat four passengers comfortably at meals, the larger table gives them ample space. At any rate, the plan is worth consideration if, as you suggest, the open centre corridor vehicle is to be extensively used after the war.

Yours faithfully,
R. E. CHARLEWOOD

Publications Received

The McIntosh Locomotives of the Caledonian Railway. By A. B. MacLeod. Staines: Ian Allan, 225-7, Laleham Road. 8 in. x 5 in. 41 pp. Price 3s. 6d.—The locomotives of the Caledonian Railway, with their smart appearance and distinctive Prussian blue livery, attracted the railway enthusiast to a considerable extent, and the fame of the "Dunalastair" class at the end of the last century, with which the cult of the big boiler began, earned lasting fame for the designer, John Farquharson McIntosh, who was Locomotive, Carriage & Wagon Superintendent of the Caledonian Railway from 1895 to 1914. Mr. MacLeod is therefore certain of a wide circle of appreciative readers, and he has served them well. He condenses within 41 pages all the essential details of the various McIntosh locomotive types; indexes them in order of building; lists their renumbering under the L.M.S.R.; and gives details of their rebuilding and withdrawals. Prefatory fea-

tures include an account of the career of McIntosh; instance the distinctive features of Caledonian locomotives; and describe in detail (with Mr. MacLeod's known precision and accuracy) the livery which played so great a part in producing the smart appearance of these engines. This little book, which is one of the A.B.C. Locomotive Series, will doubtless prove the standard source of reference on this subject.

South Wales Ports.—This booklet, which has been published by the Great Western Railway Company, contains a wealth of detail concerning the docks owned by the G.W.R. The principal of these are the extensive and important dock systems of Cardiff, Newport, Barry, Port Talbot and Penarth, of which the G.W.R. became the proprietors as from January 1, 1922. Swansea Docks came under the control of the company from July 1, 1923, and the company also owns smaller docks at Briton Ferry and Burry

Port, as well as the open harbour of Fishguard, from which, in normal times, passenger and cargo steamers connect with Eire.

The booklet is referred to in an editorial note elsewhere in this issue. Copies of the booklet may be obtained from Mr. Leslie E. Ford, Chief Docks Manager, Great Western Railway, Cardiff, price 1d.

Radicon Worm Reducers.—We have received from David Brown & Sons (Huddersfield) Ltd. an illustrated leaflet E387.45 giving particulars and dimensions of the 2½ Radicon "RHU" type worm reducer, which has been designed to transmit power from fractional horse-power up to about 2½ h.p. (according to ratio). A capacity chart is given which shows the input speeds in r.p.m. and the maximum h.p. rating (input), together with output speeds and efficiency per cent. at different ratios. The leaflet may be obtained on request from David Brown & Sons (Huddersfield) Ltd., Huddersfield.

The Scrap Heap

A constant reader compliments us in remarking that he thought our recent editorial "That Cheltenham Race Train," was grand.

During the gale which swept Great Britain in the night of January 18-19, when the wind at times reached 100 m.p.h., the platform at Hart Station, near Hartlepool, County Durham, was blown across the line and traffic was obstructed for three hours.

Stag Newspaper.—It is stated in the *Iron Times*, which expired recently during a great mortality amongst railway newspapers, that, in order to keep the concern going till a change should take place in the market, the same number was brought out day by day for a month, three copies only being printed off each time.—*From the "Liverpool Mercury," July 17, 1847.*

A TALE OF TWO TRAINS

Two trains set out from Inverness for Euston on Monday, but only one reached its destination. The first—the 4.20 p.m.—was 12 hours late reaching Perth and was later cancelled. Train number two left Inverness at 11.20 p.m. and was due at Euston at 7.8 p.m. the next day. It was 114 minutes late at Carlisle and 6 hours 38 minutes behind schedule when it drew in at Euston.—*From "The Evening Standard."*

In a planned system we cannot confine collective action to the tasks on which we agree, but are forced to produce agreement on everything in order that any action can be taken at all.—*From "The Road to Serfdom," by F. A. Hayek.*

American officer to driver of British engine: "Say, if we had an 'iron' like that back home, do you know what we'd do with it?"

"Well, just as a shot, sir, I'd say you'd either lean against it, chew it, or cuddle it."—*John Carpenter in "The Evening News."*

100 YEARS AGO

[*From THE RAILWAY TIMES, Feb. 8, 1845*]

PARIS AND STRASBOURG RAILWAY,
WITH BRANCHES TO RHEIMS and METZ—
(Compagnie de l'Est)—CAPITAL, 90 Millions of Francs,
£3,600,000

COMMITTEE OF MANAGEMENT.
Le Marquis de Ferrari, Duc de Galliera.
M. De Pellapra Ancien Receveur General de la Meurthe.
Le Baron Michael de St. Albin, Ancien Receveur General de la Moselle.
Achille Seilliere Banquier et Administrateur du Canal St. Martin.
Marcuard Banquier et Administrateur du Canal St. Martin.
C. Arroux Administrateur des Messageries Generales.
V. Dubochet Directeur de la Compagnie Parisienne de l'Eclairage.
Hinguerlot Directeur des Canal de l'Oure et par le Gaz St. Denis, et Administrateur du Canal St. Martin.
Sir John Easthope, Bart., M.P.
Abel Lewis Gover, Esq.
John Gurney Hoare, Esq.
Charles Morrison, Esq.

BANKERS.
Messrs. Barnett, Hoares, and Co., Lombard-street.
A Company has been established in France, under the above direction, for the purpose of leasing and working this line of Railway.
39, Lothbury, February 7th, 1845.



Chinese refugees make home in front of railway engine

OVERHEARD AT NEWQUAY

Two sardines were swimming around Newquay, and one decided to take a trip to Falmouth. Turning to his comrade, he said: "How shall we go round there? Let's swim up." But the other sardine replied: "No, it's too far; let's go by train." "What," replied his comrade "be crowded in like a bunch of human beings?"

CHANGING SLEEPING BERTHS

How unsentimental are my journeys. How strangely lacking in adventure compared with those of Laurence Sterne, and he a clergyman too! (Who reads "A Sentimental Journey" today?)

Kings Cross—the sleeping berth office. Yes, there was a berth but the Ministry have cancelled yours—a lady—the Head of the W.V.S.—essential—returning from important conference—must be in Inverness tomorrow night—very sorry.

So it went. I in front of the counter—the glass topped counter—tattered railway guides—behind, telephones, and bright, shiny girls in a blue colourless light—there I received my doom. A night sitting up, and I was so tired of London and potato cakes for breakfast. I hungered for Scotland. He was moved by my dejection. He has seen me often, the head booking clerk. "Will you share one?" I inquired further. "We have two-decker Firsts." Hope springs eternal. "Springs" is not the word for this occasion—it gushed. "Can you give me one?" I ploughed away with my snatchel—a better word than satchel—and found these double-deckers. How little room for so much humanity, I thought, but graciously accepted. It never occurred to me who my companion would be until a knock roused me from my undressing.

A lady, bagged, long-booted, long-coated, and spurred, presented herself. This isn't possible! It cannot be. Really.

My reactions were surprise—amazement—astonishment.

The attendant put it right. A gallant Commander gave up his single berth for my society and, I must add, to enable the Bagged-Booted one to have a room of her own for the journey.

How different Laurence Sterne?

He would have closed with the adventure. I am a poor fish. I contented myself with my gallant Commander's company and slept, undisturbed, all the way to Drem.—*From "Kings Cross to Waverley" by "Timoleon," published by William Hodge & Co. Ltd.*

TAILPIECE

The railways frequently deplore
All those who with abandon leap
To catch the moving carriage door
So nearly lost from over-sleep.

This habit they cannot condone,
And Leicester way have now arranged
For booking clerks to telephone,
And get the late arrival "trained."

The portly passenger so late
Delights to hear the speaker say:
"Guard, hold the train a minute, mate—
There's one old buffer on his way!"

So praises sing to L.N.E.
Who to ensure their trains are caught,
Safety combine with charity—
And just that little extra thought.

A. C.

OVERSEAS RAILWAY AFFAIRS

(From our correspondents)

VICTORIA

Financial Results

The gross revenue of the Victorian Government Railways for the year ended June 30, 1944, was £15,974,634, a figure which, although £1,145,589 less than the record revenue of 1942-43, was the second highest in the history of the V.G.R. The surplus for 1943-44 was £448,136, nearly £340,000 less than the record surplus of the previous year. The decrease in earnings, which occurred principally in respect of passenger traffic (£482,368) and goods and livestock traffic (£655,486) was mainly the result of the changed conditions in the Pacific war zone, which led to a substantial decline in the volume of defence traffic; the drastic reductions in services which had to be made on account of the inadequacy of the coal supplies available for railway use; and other causes arising out of the war.

Rolling-Stock Construction

The Government Railways completed during the year 1943-44 one "X" class and two "K" class locomotives, two seven-coach suburban trains, fifteen workmen's sleepers, and 221 general-service wagons.

WESTERN AUSTRALIA

Railway Timber Mill

The Government Railways Department operates its own timber mill to supply timber for its own requirements. The mill is in the charge of a Mill Manager, under the administrative control of the Comptroller of Stores. It is situated at Banksiadale, in the heart of the jarrah forests of the south west. The annual report for the year ended June 30, 1944, gives the following details concerning the year's operations:—

- (1) The length of railway line (mill line) is 44 miles 20 ch. 13 ft.
- (2) During the year, 11,137 loads of sawn timber were produced from 21,985 loads of log timber. Of the former quantity, 4,277 loads were of sleepers. Firewood produced amounted to 3,486 tons. Sleepers were produced to a total of 108,861, which represented approximately 27 per cent. of the department's consumption for the year, the balance of which was obtained from outside sources.
- (3) A sum of £4,419 was paid to the Forestry Department in royalty on timber.
- (4) The output of the mill was below normal, due to shortage of staff through causes incidental to the war.

Gasification of Collie Coal

At the Railway Workshops, Midland Junction, an experimental plant has been erected to obtain industrial gas from Collie coal and use it in the workshops furnaces. Collie coal, which is described as a sub-bituminous coal verging on black lignite, is used practically entirely as a locomotive fuel on the Government Railways, and for general industrial purposes, but it has not hitherto been considered as a gas coal.

The inventor of the plant is Mr. F. C. Fox, who interested the Department of Industrial Development in his ideas to such purpose that the Government decided to finance the erection of a pilot plant at Midland Junction and to supply industrial gas to one of the furnaces there for trial purposes. At a recent demonstration, at which many representative citizens were

present, gas was supplied to a furnace, and to a domestic gas stove.

The economics of the position have yet to be proved, but the inventor claims that, apart from the fact that it has the great advantage of using the local coal product for gas production, the erection of the plant costs about one-third of that of ordinary gas plants, that gas is produced in a small proportion of the time normally taken, and that the whole of the coal is gasified.

The State is rich in both coal and iron, and the practical use of local coal for gasification for industrial and domestic purposes would not only widen the future and the scope of the coalfields, but would help greatly in the development of existing and new secondary industries. There also are possibilities in the way of gas plants to supply domestic gas to townships not hitherto considered large enough to warrant the installation of orthodox gas plants using imported coal; this should be particularly applicable to those towns situated close to coalfields, where freight on the coal from its source would not be a major item.

CANADA

C.P.R. Rolling-Stock Improvements

Better riding conditions for freight vehicles and improved heat-control for dining cars is being provided by the Canadian Pacific Railway through the fitting of stabilised bogies to 300 refrigerator vans, and of spring snubbers to 1,500 other goods vehicles, and through the substitution for manual control of heat of a thermostatic system in 16 dining cars. The work is being carried out at the Angus Shops.

UNITED STATES

Louisville & Nashville C.T.C.

The Louisville & Nashville Railroad has decided to instal centralised traffic control over the 107 miles of its Lebanon branch between Lebanon Junction and Sinks, Kentucky, which is single line throughout. A style "C" control machine will be installed in the dispatcher's office at Louisville, 30 miles north of Lebanon Junction, and, in addition to the code equipment, the contract with the Union Switch & Signal Company for the materials includes searchlight high and dwarf signals, dual-control electric switch machines, and electric switch locks. Installation will be by the railway's own staff.

Moving a 164-ft. Cylinder by Rail

A remarkable consignment was worked recently by rail from the works of the Chicago Bridge & Iron Company at Birmingham, Alabama, through to a plant in the Chicago District over the lines of the Louisville & Nashville, Tennessee, Alabama & Georgia, Nashville, Chattanooga & St. Louis, and Illinois Central Railroads. This was a cylinder 163 ft. 7½ in. long and about 9 ft. in diameter, carried on four bogie flat wagons. Actually, the second and third wagons acted merely as runners, and the load was supported on the inner ends of the first and fourth, with bearings 113 ft. 2½ in. apart. This left an overhang of 27 ft. 5 in. at one end of 23 ft. 4 in. at the other. When the load was moving round curves or through turnouts into yard or passing tracks, it was necessary to clear the adjacent lines, and extremely careful calculations of weights and clearances had to be made before the final route was selected. This is

believed to be the longest rigid consignment ever moved by rail in the United States, though the Canadian National Railways claim to have handled a slightly longer cylinder in Canada.

Another Broken Rail Derailment

A broken rail has been responsible for another serious derailment, in which 47 passengers were killed and 36 injured. This occurred at Stockton, Georgia, at 11.45 p.m. on August 4, to Train No. 57 of the Atlantic Coast Line Railroad en route from Waycross, Georgia, to Montgomery, Alabama. The train consisted of 14 vehicles, of which eight passed safely over the affected rail; the ninth, a sleeping car, was derailed without injury to any of its passengers, but the tenth, an all-steel coach loaned to the Atlantic Coast Line Railroad by another company, was thrown against the engine of an eastbound freight train standing at Stockton, and was practically demolished. Of the next four carriages, all of which were derailed, three were empty; the last vehicle, a hospital coach, remained upright.

The rail which broke was of 100-lb. flat-bottom section. The last occasion on which a Sperry detector car had patrolled the route in search of transverse fissures was a year previously, when the rail concerned showed no defect.

ARGENTINA

New State Railway Link with Brazil

A credit of 24,200,000 Argentine pesos has been granted for the construction of a railway between Guruzu Cuatia and Paso de los Libres. This will form part of the Argentine State Railways in the province of Entre Rios, the only federally-owned standard-gauge lines in Argentina. It is intended to lay a third rail, providing a mixed gauge, so that the line can connect with the Brazilian narrow-gauge railway on the international bridge under construction across the Uruguay River between Paso de los Libres and Uruguayana.

The bridge, which is being built jointly by the Argentine and Brazilian Governments, is scheduled for completion by the end of the present year. It is to be a combined railway and highway bridge, of a total length of 4,626 ft. Of the Argentine half of the bridge, 17 out of 20 piers are complete, and 918 ft. of the highway bridge have been constructed. On the Brazilian side, 19 out of 20 piers are finished, as well as 459 ft. of the highway and railway bridge.

CEYLON

Railway Claims Expenditure

Claims for compensation and refunds against the Ceylon Government Railway are on the increase, and it is stated that an average of 40 cases a day is handled by the railway department concerned, despite diligent measures and the appointment of special investigators and checkers. The claims dealt with by the headquarters staff are said to have increased to nearly six times the pre-war figures. It is said that for every crime detected, nearly 100 are committed without the culprits being caught. A sum of Rs. 100,000 has been allocated in the railway budget for expenditure on account of claims, but it is stated that the vote may prove insufficient if the number of claims does not decrease considerably. The estimated expenditure on this item in 1943-44 was Rs. 50,000, whereas the actual amount spent in the previous year was Rs. 216,603. In 1938-39 the railway paid Rs. 11,759 by way of compensation.

A Look at the Coming Locomotive

Thermal efficiency subordinate to capacity—Designer alone is not responsible for availability

By Ralph K. Johnson*

Chief Engineer, Baldwin Locomotive Works

DESPITE competition from all other types of transport, the railways always have obtained at least 60 per cent. of the total freight traffic. Thirty-six per cent. of this comes from manufactured and miscellaneous products and the balance from bulk goods, such as building materials, grains and coal. With this backlog the railways can afford to spend money for improvements that will attract a greater proportion of the high-class freight, express, mail, and passenger traffic.

Railway motive power has been subjected to extraordinary wear and tear during the war years. Peace will make necessary a careful survey to determine whether this accumulated depreciation should be restored through repairs or through the purchase of modern and efficient power.

Another favourable sign that there will be post-war locomotives to design is the fact that the cash position of the railways should be high at the end of the war. The fixed charges of 25 Class 1 roads will have been reduced 70 per cent. when plans for reorganisation are completed and approved. In addition, much of the locomotive inventory is obsolete. For example, in 1941, less than 3 per cent. of the steam locomotives owned by Class 1 railroads were under 10 years of age; in 1914 there were 57 per cent. in this category. In 1941, 47 per cent. of a total of 41,765 steam locomotives were between 16 and 26 years of age, and 50 per cent. were over 26 years of age.

Electric, Diesel and Steam Locomotives

The diesel locomotive seems at the moment to be tied to electric propulsion, and this means that designing ingenuity will be confined to the diesel engine proper. Higher speed and more compact engines may allow the placing of more power in a given space. Better materials and processes will give the designer a chance to improve reliability and lower maintenance. The diesel will acquire an added appeal if future engines can be designed to burn lower grades of oil. Work is being done along all of these lines and we have every reason to believe that post-war diesel design will not be static.

The electric locomotive comes closer to a railway man's ideal of motive power than any other type, but unfortunately the capital investment required for substations, transmission lines, overhead wires, and so on, make its cost prohibitive, except where density of traffic is very great. However, in certain parts of the country, where extensive government projects have excess power available at low rates, railways may find it profitable to re-examine this type of power for main-line freight haulage.

In taking up post-war designs of steam locomotives I cannot refrain from making a few general remarks in reply to those who point with scorn to this type of power as "obsolete" and "backward." The main criticism is that the locomotives of today are reciprocating, non-

condensing types of from 6 per cent. to 8 per cent. thermal efficiency, rather than high-pressure, high-temperature, turbine, condensing locomotives of up to 20 per cent. thermal efficiency. The implication is that designers have not troubled themselves to achieve higher efficiencies, whereas nothing could be further from the truth.

Locomotive designers for years have striven for greater efficiency, but the cold, hard facts of economics have usually prevented full realisation of theoretical savings. For the fuel and water savings resulting from higher thermal efficiencies must not be swallowed up by high operating and maintenance costs, capital charges, or unreliable performance. Most important of all, at least in the United States, is the fact that fuel is cheap and railways are not so interested in saving a few tons of coal as they are in getting the maximum power in a given weight and space. In other words, United States railways are interested first, in weight-space efficiency, and only secondarily in thermal efficiency.

If it were possible to get 25 per cent. thermal efficiency in a steam-power plant of no more space and weight than required for a steam locomotive, why do public utilities build stationary plants covering city blocks? The answer is that the equipment required to obtain the high efficiency, including chain grate stokers, pulverising equipment, combustion-space volume, stacks, preheaters, economisers and condensers, takes considerable space. This space is simply not available on a locomotive and no device to improve the thermal efficiency of a locomotive can survive unless it gives a greater power return within the space and weight limitations. The superheater, feedwater heater and poppet valve fulfil this requirement, but the many other refinements available in stationary practice have not yet been made available in sizes suitable for application to locomotives.

Some Early Developments Still Good

As an example of the restrictions imposed on thermal efficiency by weight-space characteristics, consider a locomotive, which working at a high rate, may require a back pressure of 20 lb. per sq. in. to burn coal at the rate required for adequate evaporation. At this high firing rate the velocity of the gases entering the tubes may be as high as 300 m.p.h. and it is quite possible for 25 per cent. of the coal fired to go up the stack unburned. If the draft is reduced to avoid this loss of coal up the stack, then insufficient water is evaporated and the locomotive cannot deliver the power demanded.

The success of the first locomotive was not assured until 1827 when the exhaust steam from the cylinders was applied through a blast pipe into the stack to increase the draft in the furnace. Consider the beautiful simplicity of this arrangement. Induced-draft fans in the smokebox have been tried but, due to the high temperatures and abrasive action of the cinders, their maintenance is excessive. Using the exhaust steam through a blast pipe not only requires no moving parts but automatically adjusts the

draft to suit the power requirements. It is simple, cheap and automatic. The undoubted advantages of forced or induced-draft fans simply cannot compete economically, as yet.

The fire-tube locomotive type boiler can generate steam in greater quantities and faster for a given space than any other type of boiler. Consider its ability to evaporate 100,000 lb. of water per hour at pressure up to 300 lb. and with a total steam temperature of 750° F. and still weigh only about 65 tons, including feed-water heater, superheater, grates and all necessary piping and accessories. When, to this high capacity in a small space, is added its simplicity of construction, low maintenance and ability to respond quickly to varying power demands, it becomes evident why this type has fitted the needs of the railways so admirably. It also has been used extensively on destroyers for the same reason. It liberates as much as 400,000 B.Th.U. per cu. ft. of combustion space, where large and efficient stationary plants liberate only from 25,000 to 50,000 B.Th.U. per cu. ft. It evaporates in a given time, 10 times as much water as a stationary plant of 25 per cent. thermal efficiency with few of the economy devices and with less than one-tenth of the weight and space required by the stationary plant.

Future Locomotive Characteristics

The reason the steam locomotive of today has retained so many of the characteristic features of the original Stephenson design, is that it has met the above requirements better than the numerous attempts to improve on it. However, many improvements in steam locomotive design have met the rigorous demands of service and have been incorporated in modern designs. For example, the superheater, feedwater heater, light reciprocating parts, alloy steels, lateral-motion devices, locomotive bed castings, mechanical lubrication, roller bearings, and many more are on the way to "making the grade," such as the poppet valve. The steam locomotive of the post-war years is not going to take a sudden dramatic jump into higher thermal efficiencies, or 100 per cent. availability, but the steady improvement of the years will be continued. Availability, which means the opportunity to amortise capital charges more quickly, should be the main aim of designers, rather than thermal efficiency.

Some of the details that identify modern power do not change the outward appearance of a steam locomotive much, but "hide their light under a bushel." Nevertheless, all locomotives will have the complete list in the future:—

- Adequate steam passages.
- Large grates.
- Combustion chambers to give large furnace volume.
- Mechanical lubrication of as many places as possible.
- Alloy-steel boiler plate.
- Light weight reciprocating parts.
- Greater use of alloys and heat-treated parts.
- Proper counterbalancing
- Feedwater heaters.
- Lateral-motion devices.
- Locomotive bed castings.
- Roller bearings.

Then there are other problems on which much effort is being expended. Some are being solved and others are proving hard nuts to crack. I will name a few.

Poppet Valves.—A reciprocating steam

* Abstract of a paper presented before the Pittsburgh Railway Club on September 28 and the Southern & Southwestern Railway Club on November 16 and reported in the *Railway Age*

locomotive with a piston valve cannot have the valve events arranged for the most efficient use of steam at all speeds, as the valve ties all events together rigidly. The poppet valve, by allowing the various valve events to be regulated independently of each other, offers an opportunity to use steam more efficiently, especially at higher speeds. Higher mean effective pressures at higher running speeds raises the power output of the locomotive. Poppet valves are now in service on a number of roads and have proved their reliability.

Burning Pulverised Coal.—The accomplishment of this in locomotive boilers has always fallen down for one reason—slagging. There is no trouble getting good combustion in the firebox of a locomotive but this is only half of the problem. The fusing temperature of the ash in the coal is around 2,200° F. With the temperature of combustion around 2,800° F. the ash is molten and quickly coats the furnace, cutting down heat transfer. Therefore, the furnace must be big enough to cool the ash below 2,200° before it hits any heat-absorbing surface. This is difficult even in stationary practice where plenty of space is available.

High Pressure and Temperatures.—Boiler repairs, both in time consumed and cost, are now the greatest handicap to steam locomotive availability. Higher pressures than 350 lb. per sq. in. will require water-tube boilers, and so far it has not proved possible to design a water-tube boiler, within the space available, that offers hope of lower maintenance. Regardless of the improvement in thermal efficiency possible with higher pressures, the railways will not accept any boiler that adds to boiler maintenance difficulties. Some of the problems posed by higher pressures are:—

Special valves and fittings required to stand both pressure and cutting action of high-pressure steam.

Steam and water drums—expensive if solid-forged.

Tubes and possibly drums would be welded in place, which would require change in I.C.C. rules.

Structural strength of locomotive now dependent on boiler, would have to derive from some other source.

Difficulty in retaining water level on grates with drums.

Forced or natural circulation. If forced circulation, pump reliability is essential.

The best of feedwater required.

How to clean tubes as required by I.C.C. regulations.

Special materials required for superheater units.

Where to store a reserve of steam for sudden, short-term demands.

More complete combustion necessary or stack heat losses will be large.

What type of prime mover can use higher pressures to best advantage; simple reciprocating, compound reciprocating, or turbine.

How high should pressure be? Gain in efficiency falls off rapidly above 600 p.s.i. All of these problems can be met and several designs are at this moment being considered for trial, but it still is not clear whether they will meet the test of improving the availability of the steam locomotive.

Welded Boilers.—One of the surest ways to lower the maintenance costs of locomotive boilers, as well as the weight, is to weld them completely. At present this is prohibited by I.C.C. regulations, but permission has been given to build several welded boilers, and in time I believe their use will become standard.

Turbine Drives.—A number of turbine locomotives, both condensing and non-condensing, direct-connected and with electric transmission, have been built in the past and probably the only comment necessary is that none of them have been duplicated. The condenser unit is complicated and requires more space than is available. Also, its maintenance is high. Therefore, the most recent efforts have been with non-condensing types. The turbine's advantages of more power per unit of steam, uniform torque and lower maintenance have made it attractive in spite of its variation in efficiency with load. At the present time a locomotive of this type designed by Baldwin and Westinghouse, is about to go into service on the Pennsylvania and it is expected will prove attractive for high-speed, long-distance passenger service. Its advantages are:—

A 15 per cent. to 20 per cent. improvement in thermal efficiency over a conventional two-cylinder reciprocating steam locomotive.

Elimination of reciprocating parts, dynamic augment, and unbalanced forces.

Shorter rigid wheel-base for equal capacity.

Smaller wheels satisfactory.

Lower centre of gravity.

Improved high-speed performance.

Gas Turbine Locomotives.—The application of a gas-turbine to a locomotive offers advantages in railway service, and after the war an experimental gas turbine for locomotive application will doubtless be built. The thermal efficiency of such a locomotive should be approximately 17 per cent.—about double that of a steam locomotive.

The Duplex Locomotive

There is an advance type of motive power now on the market which has definitely proved itself in service, and which I believe is going to be both popular and economical. It is not too radical in design to make it slow of acceptance, but it does embody the best of locomotive art. I refer to the four-cylinder duplex type, of which the Pennsylvania's "T-1" class is the outstanding example. The reasoning behind this type is simple.

The 4-8-4 type locomotive has become increasingly popular in the last 15 years as an all-round passenger and freight locomotive. But its great power resulted in high piston loads and increased maintenance of crank-pin bearings and crank pins. Therefore, it seemed logical to split the two cylinders into four, and to retain the rigid frame. Locomotives of this type have been built as 4-4-4-4s, 4-6-4-4s and 4-4-6-4s. Cylinders have been tried at front and back but the better arrangement seems to be front and centre, in spite of the longer rigid wheel-base. Some of the advantages of this type are as follow: The stroke is shorter, resulting in lower piston speeds and allowing a higher mean effective pressure in the cylinder at a given locomotive speed.

The Pennsylvania's 4-4-4-4 type locomotives have a piston load of 92,000 lb., whereas the usual 4-8-4 type runs about 150,000 lb., and we have built them with a piston load as high as 185,000 lb. The smaller load on the 4-4-4-4 type pins means smaller bearings at the back end of the main rod. The rod arrangement is the most simple and permits of the best possible condition at the main side-rod connection, which in the four-coupled arrangement need only be large enough to transmit the load to one pair of drivers as contrasted with the large side-rod connection necessary on 4-8-4 to

transmit the load to three pairs of drivers.

As the number of coupled drivers increases, so also does machine friction. Splitting up the drivers of a 4-8-4 into two groups, as on the 4-4-4-4 type, reduces the machine friction and so gives a higher drawbar, especially at high speeds. A 4-8-4 type with a 27-in. cylinder and a 12-in. piston valve is definitely crippled at speeds by the inability of the valve to handle the steam efficiently. The poppet valve overcomes this handicap and is equally effective on the four-cylinder type, but if piston valves are used the four-cylinder type has a definite advantage over the 4-8-4.

The maintenance of this type of locomotive should be less than that of a 4-8-4, 2-10-4 or articulated type of locomotive, as the reciprocating parts are light, the rods simple, and the piston thrust low.

What About Availability?

The diesel locomotive sells itself primarily on account of its high availability. But a large part of this availability arises from the fact that users have been forced by its high cost to keep it running. No expense is too great to improve its productive time. Railways purchasing diesels immediately instal concrete inspection pits, drop tables and special facilities of all kinds, including store-rooms full of spare parts. Then they send an extra man along on all runs to make minor repairs, *en route*. Terminals which used to get along with 10 to 15 men to handle all steam power, immediately jump to 40 to 50 men when part of the service is changed to diesel power. This is commendable and desirable, but if the same interest in keeping steam locomotives moving was exhibited, a surprising increase in availability would ensue.

The writer knows of several terminals where wheels of steam locomotives cannot be dropped and, even if they could, no spare set of driving wheels would be available. A locomotive coming into these terminals with driving-wheel trouble has to be shipped "dead," in one particular case, a distance of 200 miles to get new wheels, with the result that it is out of service a week instead of one day.

There are also many terminals where no hot-water boiler washing facilities are available. Washing and filling with cold water results both in greater time out of service and increased maintenance. Yet, such terminals have operated this way for years, in spite of pleas by superintendents of motive power to management. But all of you have seen the complete terminal facilities for diesels.

Records with Modern Steam Power

There never was anything inherent in a steam locomotive that prevented it being run over several divisions, and yet for years they were never run beyond one division and there are still some lines that will not run their locomotives as far as they should. The Association of American Railroad Superintendents' report of 1941 shows average miles per active locomotive day of 195.6 in passenger service, and 116.4 in freight service. Compare this with a 4-6-4 type locomotive on the Milwaukee that made 10 complete round trips in 30 days of 1,839 miles each, an average of 613 miles per calendar day; and this with no special attention. One has only to study the remarkable records made by the Norfolk & Western which made its 2-8-8-2 type steam locomotives available 17½ hours out

(Continued on page 137)

Assam-Burma Front Communications

A description of the pre-war communications and the measures taken to improve them to meet military requirements. Also some notes on the road communications serving this front

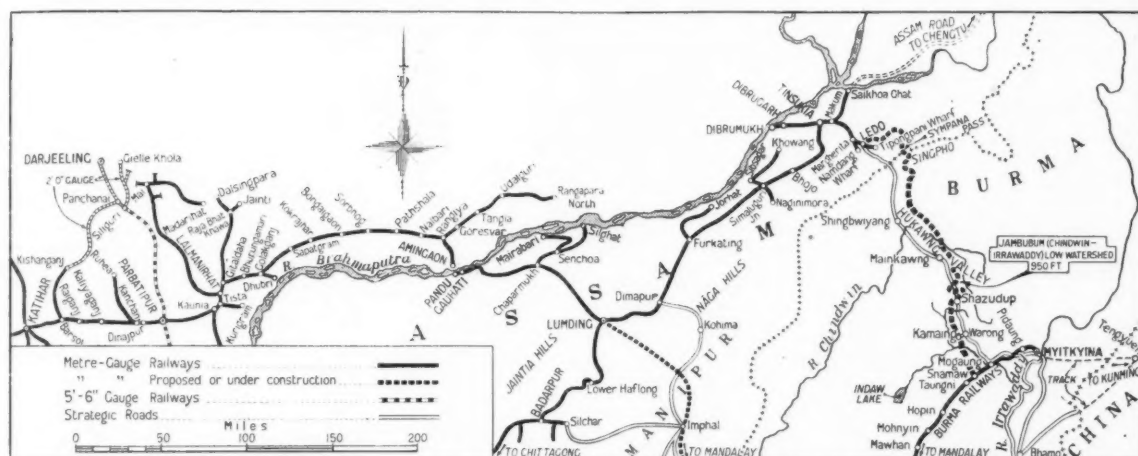
IN January, 1942, the rapid advance of the Japanese up the whole length of Burma created a direct threat of invasion to India through Upper Burma and Assam. Only then was it realised that rail communications to the North East or Assam-Burma frontier were totally inadequate for the transport and supply of the large forces necessary for the defence of this frontier.

Communications to and in the province of Assam have always been bad. Assam is the Cinderella Province of India, beautiful but poor; for transport it is served only by the navigable Brahmaputra River and

It will be noted that both the routes serving Assam from Calcutta are partly of broad and partly metre gauge, but the route from the port of Chittagong is entirely metre gauge. All the metre gauge is single line.

There is a tendency among the uninitiated to regard a metre-gauge line as a toy railway or tramway, but this imputation is not considered justifiable by railwaymen. Actually, in India the metre-gauge minimum fixed structure dimensions permit loads larger than broad-gauge maximum moving dimensions to be run on special certificate. The rolling

It was only when the sudden call came for the immediate mobilisation of the railway communications to the North-East Frontier that it was appreciated how sweepingly the railways of India had been denuded of both staff and equipment to feed other fields of war effort. Whole sections of line had been dismantled, and with them all spare rails, points and crossings, as well as permanent way tools, had been sent to the Middle East and Persian fronts. No supplies of fittings or tools had been received since war broke out, so that even the maintenance of tracks had become difficult. Railway staff had been released to join the Forces, and old and ex-railway employees of every grade had been taken by the army for the formation of railway companies for service in other fields. Rolling stock also had been sent overseas, and both workshop staff and machinery had been de-



Sketch map showing Assam rail and road communications with Ledo-Burma road and proposed railway

by two rail routes which include single-line metre-gauge railways, namely:—

(1) The former Eastern Bengal Railway broad-gauge main line from Calcutta to Parbatipur and the metre-gauge secondary main line from Parbatipur to Amingaon with a wagon-ferry over the Brahmaputra to Pandu, and thence the former Assam-Bengal Railway from Pandu via Gauhati and Lumding to Tinsukia, also metre gauge; and

(2) The former metre-gauge Assam-Bengal Railway from Chittagong through the North Cachar hills joining the above route at Lumding. This section also has a connection with Calcutta, another broad-gauge section of the former Eastern Bengal Railway running to Goalundo, whence there is a regular daily steamer service to Chandpur, on the Assam-Bengal system. The Eastern Bengal and Assam-Bengal Railways have been amalgamated and are now entitled the Bengal & Assam Railway.

At Tinsukia the line from Lumding is joined by the Dibru-Sadiya Railway, a single metre-gauge line that runs from Dibrugarh—the steamer companies' terminus on the Brahmaputra—up to Ledo, the farthest east railroad in India. This line has a colliery extension to Tipongpani situated in the foothills of the Patkai Bumai range that separates India from Burma, and this branch traverses the valley up which starts the Indo-Burma railway project via the Hukawng Valley to Moggaung in northern Burma.

stock is of almost the same width as that on the standard English 4 ft. 8½ in. gauge, and the standard four-wheel goods wagon with a tare weight of six tons will carry a 12-ton load; the older stock carries a 10-ton load with a five-ton tare. An ordinary goods train loads up to 50 wagons with a net load of 500 tons and is hauled by an engine weighing 95 tons at speeds of 25 to 30 m.p.h. Passenger trains consist of bogie carriages and run at speeds of 40 to 45 m.p.h. A single metre-gauge line has a delivery capacity of some 5,000 tons of goods a day. Since regrading was carried out on the two metre-gauge main lines serving Assam, no grades exceed 1 in 150, except on the 115-mile length of the hill section of the Assam-Bengal Railway, which is worked under special conditions. There the ruling grade is 1 in 60, but included in this section is an 11-mile "pusher" grade of 1 in 37.

Until 1925 there were only two real metalled roads in Assam, one from Gauhati to Shillong and the other from Dimapur to Manipur. Since then many of the roads have been lightly metalled with shingle, and some of the busier portions have been tar-macadamed. During the same twenty-year period the railways have been improved by regrading, relaying with new and heavier rails, and the installation of new signalling. As a result, before the outbreak of war the A.B.R. was running mail trains at 40 m.p.h. and goods trains with 500 tons net load at lower speeds.

pleted. What remained was largely employed on, and used for, turning out munitions. All these severe handicaps made it extremely difficult to meet the urgent instruction to double or, if possible, treble the carrying capacity of the lines feeding this frontier. Moreover, almost simultaneously with this instruction, a demand came for many miles of sidings for the construction of airfields.

As traffic continued to increase, the lack of station accommodation and siding space became very pronounced, and so steps were taken to provide additional crossing stations and sidings. It was, however, extremely difficult to procure the necessary materials owing to the all-India shortage and an India-wide demand. Even when material had been allotted, it was no easy matter to get a consignment through, and it was rare for a consignment to arrive complete. Despite these difficulties, considerable improvements were effected, but this encouraged a still further demand for more freight to be carried. To quote a case in point: on one section of 90 route-miles during the year April 1, 1942, to March 31, 1943, the ton-mileage increased by 186 per cent. of that carried in 1941-42, and an additional 20 miles of track in sidings had been laid. During 1943-1944 the ton-mileage had gone up to 270 per cent. of the 1941-42 figure, and a further 20 miles of additional sidings were laid. Actually, these figures are an understatement, as, because of staff shortage and bad book-

ing, a considerable quantity of freight was carried unbooked or without invoice papers; the increases in the mileage of sidings are net increases and do not take account of sidings lifted and relaid in new positions.

To increase the movement of trains, a complete traffic control system was installed, and came into full working order towards the end of 1943. From about April, 1942, various Indian railway units were sent on to the Bengal & Assam Railway system to supplement the normal establishment; they consisted of construction, maintenance, operating, and work-

wards, working through the existing staff and employees; these units provided for a very much closer control of all operations by reinforcing existing staff with reliable, experienced, and trained men. The Americans brought with them the latest tools and equipment for all classes of railway work, to supplement the tools and plant already in use.

It was about this time also that new metre-gauge locomotives and stock began to arrive from America for the lines in and serving Assam.

Among the more important engineering works that have been taken in hand to

vision of additional turning-triangles, water supplies, and other facilities, and numerous new roads crossing the railway called for large numbers of level crossings.

The Indo-Burma Railway

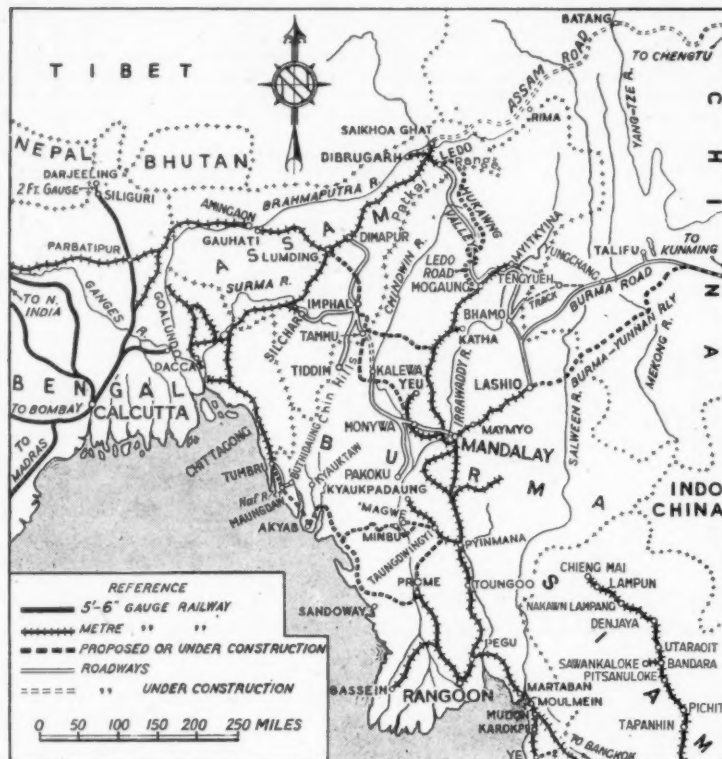
Before leaving the subject of rail communications in this area, a few notes on the Indo-Burma Railway, as at present proposed by the Hukawng Valley route, may not be out of place. Several reconnaissances and a preliminary (detail) survey have established that the formidable Patkai range—along the crest of which runs the Assam-Burma border—can be crossed at the Sympana Pass at an altitude of under 2,800 ft. and with a summit tunnel only $\frac{1}{4}$ mile long. Also that, alternatively and in aggregate, either 30 miles of 2.7 per cent. or 52 $\frac{1}{2}$ miles of 1.6 per cent. pusher grades are feasible on both approaches, on which, however, the cost of formation will be very high. The Upper Chindwin River is directly approached from this pass by the 110-mile-long Turong Valley. In fact, a feature of the whole alignment—apart from the deviation to reach the pass—is its directness.

After crossing the Chindwin, the line passes through the comparatively open Hukawng Valley to cross the remarkably low Chindwin-Irrawaddy watershed at Jambubum, 950 ft. above sea level. It then follows the Mogaung River to join the Mandalay—Myitkyina section of the Burma Railways about 10 miles southwest of Mogaung Station, and at a point some 278 miles from Ledo. Apart from those on the Patkai approaches, the gradients throughout are moderate considering the country traversed.

As will have been appreciated from the foregoing brief reference to the roads in Assam, they were practically all of too light a construction to carry the heavy lorry and other traffic that developed with the military occupation, nor were there any roads that led over the border into Burma. The best available road was the 130-mile highway from Dimapur via Kohima to Manipur with a track leading on down into Burma; this road has been widened, extended, and greatly improved. It runs through very difficult precipitous country in an unstable tertiary formation.

The main Assam trunk road from Gauhati via Jorhat, Dibrugarh, and Makum formerly ended at Margherita on the south bank of the Dehing river, and it is an extension of this road into Burma that is now known as the "Ledo Road" or the "Road to China." In February, 1942, work was begun on this road; a roadway was made over the Dehing River on the Assam Railway & Trading Company's railway bridge, and this made available that company's metalled road for a further 8 miles, to a point two miles beyond Ledo; this portion was doubled in width and heavily metalled. The entirely new road started from this point and was constructed along the colliery line railway embankment up to Lekapani, whence it was carried up the Tirap Valley, and was to have followed the alignment selected for the Hukawng Valley Indo-Burma railway route, referred to in our editorial on p. 127, via the Sympana pass. Plans were changed, however, and the road, soon after leaving the Tirap River, was diverted and carried up over the considerably higher Pangsau Pass. The country through which this road passes is difficult and precipitous. The formation is of late tertiary series, consisting of blue clay shales, sandy clay shales, and sandstone—in fact, a country of the same

(Continued on page 145)



Sketch map showing existing and proposed connections between India and Burma and also main roads

shop companies. These units, commanded by their own officers, worked in with the permanent staff under the general direction of the local railway District Officer. To some extent this relieved the burden that previously had been carried by the depleted permanent staff.

Early in 1943 there was a large concerted movement, politically inspired, to sabotage communications in India. Many trains were derailed, telephone exchanges destroyed, telegraph and telephone wires cut; and station buildings, goods sheds, rolling stock, and post offices were burnt. This action was so widespread and so well organised that communications all over India were seriously disorganised and the capacity of the various lines for movement of freight and passengers was reduced to an extent that took many months to make good. This sabotage affected Assam, and, as well as causing much damage, made it necessary to use experienced gangmen as night patrols.

In March, 1944, the whole control of operations came under various American Railway Corps, which were responsible for all operation and work from Parbatipur east-

increase the capacity of these lines and to provide essential military requirements are the following:—

- (1) New crossing stations between nearly all old stations to reduce the length of the block sections to about four miles.
- (2) Additional marshalling and sorting yards.
- (3) Remodelling of and extensions to nearly all existing yards and wayside stations to facilitate shunting.
- (4) Doubling certain sections of the track where bottle-neck traffic conditions occurred.
- (5) Additional wagon-ferries at Amingaon-Pandu on the Brahmaputra.
- (6) New railway-served river ghats, for the transfer of goods from river to rail and rail to river. Large extensions of the existing ghat sidings to give increased berthing accommodation.
- (7) Construction of many off-loading depot yards to ease the clearance of military loads.
- (8) Construction of sidings for the supply of river sand and for quarry stone for aerodromes and roads.
- (9) Construction of sidings for building aerodromes and for servicing them when built.
- (10) Temporary housing for the very big increase of staff and labour employed on transportation.

The great increase in the numbers of engines running also necessitated the pro-

Dwarf-Type Colour-Light Distant Signals, L.N.E.R.

The L.N.E.R. has some dwarf colour-light distant signals in service near London



BY the courtesy of the Chief Engineer of the L.N.E.R., Mr. J. C. L. Train, we are enabled to illustrate the dwarf searchlight-type colour-light distant signals recently placed in service on the up main and up slow lines near London. In our issue of December 24, 1943, we illustrated some dwarf colour-light distant signals in that case of the multi-lens type—in service on the L.M.S.R., where they have given every satisfaction.

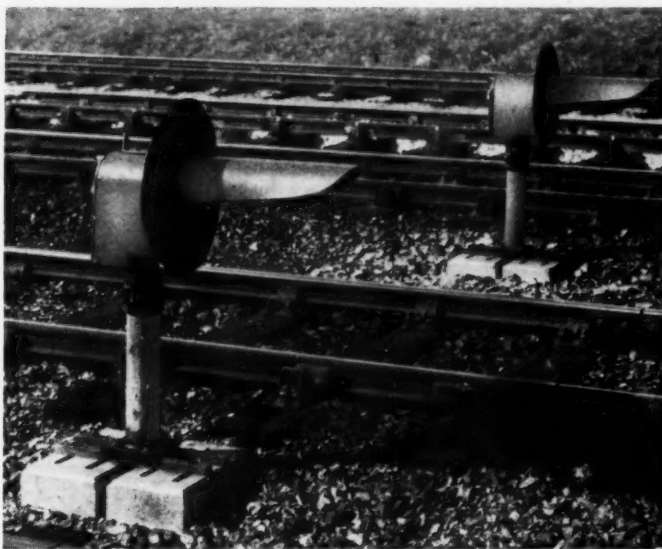
There are many locations where it is impossible to erect a post of ordinary height, which would bring the signal aspects to cab sighting level, and hitherto the practice has been to erect gantries or bracket structures to support the signals. These are costly and, moreover, have to be strong and rigid to prevent vibration from disturbing the alignment of the light beam. In some cases an expensive structure spanning several tracks is necessary to carry a single signal. It has also been found necessary at some L.M.S.R. locations, in order to keep the signals as low as possible and yet permit the passage of out-of-gauge loads, to fit special means of lifting them clear when required.

Where, however, there is a sufficient length of straight track in rear of a signal and all other conditions—such as absence of obstacles which could interfere with the view—are favourable, the dwarf type signal is found to provide a relatively

cheap alternative and one which, in spite of the misgivings expressed when the idea was first proposed, has been found quite effective in practice.

The difference in installation and maintenance cost between this simple arrangement and the use of brackets or bridges is considerable. The visibility of the dwarf type signals is found fully to meet requirements and it is considered by some that, under certain conditions at least, there is less interference from fog than with signals placed higher up. By using position-light signals for shunt movements and eliminating colour-lights as a ground signal, confusion is avoided, any colour light aspect then being necessarily one applying to running movements. In the case of the signals illustrated in this article approach lighting is employed, the aspects becoming visible when a train passes the starting signals in rear, 1,310 yd. away. The controls are arranged on the method usually used on the L.N.E.R. for searchlight signals used as distant signals. A long signal bridge formerly stood at this particular location.

We understand that the possibility of using running signals of this height was first suggested on the L.N.E.R. some time ago and tests made to prove the practicability of the idea, now officially on trial.



Side view of dwarf-type colour-light distant signals, showing A.R.P. hoods, L.N.E.R.

A LOOK AT THE COMING LOCOMOTIVE

(Concluded from page 134)

of 24, to see that much can be done to make unused locomotive capacity available. Records on many railways show that modern steam power, less than 10 years old, is capable of operating approximately twice the number of miles per month than can be handled by locomotives of 20 years of age. Much of this ability results from the fact that modern locomotives can run 300,000 miles between shoppings, where older types had trouble making 100,000 miles.

An oft-mentioned handicap of steam locomotives is the necessary stops for

water and coal. Proper location of fueling, watering and servicing facilities could also be profitably studied. One line reports a saving of 55 minutes on each manifest freight train at two terminals as a result of arranging for the taking of coal, water and sand; the dumping of ash pans and servicing at one spotting of the locomotive. Only 4 min. are required to take 15,000 gal. of water and 30 tons of coal. Tenders with coal capacities of 42 tons have been built and this makes possible 600-mile runs with the largest power.

Railway managements with a real desire to save money should examine with a critical eye their utilisation of steam

power, rather than look entirely to the steam locomotive designers to furnish some super-locomotives that will automatically reduce their costs.

CONTROL OF IRON AND STEEL.—The Minister of Supply recently has made the Control of Iron & Steel (No. 37) Order, 1944 (S.R. & O. 1944, No. 1440), and the Control of Iron & Steel (No. 38) (Scrap) Order, 1944 (S.R. & O. 1944, No. 1423). Copies of both Orders may be obtained from H.M. Stationery Office, York House, Kingsway, W.C.2, or through any bookseller, price 1d. in each case.

Kenya & Uganda Railways' War Effort



Rear view of the departure of a troop train from Nairobi Station, K.U.R. The locomotive running shed is shown on the right



A troop train, drawn by a Beyer-Garratt locomotive, in Nairobi Yard, K.U.R.

Photos]

[East Africa Command

RAILWAY NEWS SECTION

PERSONAL

The viscounty of the United Kingdom conferred in the New Year Honours on the Rt. Hon. Wyndham Raymond, Baron Portal, D.S.O., M.V.O., was gazetted on February 2 by the name, style, and title of Viscount Portal, of Laverstoke in the County of Southampton. Viscount Portal, who was Minister of Works, 1942-44, is a Director of the Great Western Railway Company.

The Great Western Railway Company announces that Lord Mildmay of Flete has resigned from the board. He became a Director in 1915. Lord Mildmay was also a Director of two G.W.R. associated bus companies, Devon General Omnibus & Touring Co. Ltd. and Western National Omnibus Co. Ltd.

Mr. H. N. Anderson has been confirmed in his position as General Manager of the Buenos Ayres Great Southern and Buenos Ayres Western Railways, which he had held provisionally since the retirement of Major Oscar Loewenthal.

The directors of the Midland Bank Limited announce that Mr. Stanley Christopherson, who accepted the Chairmanship on the death of Mr. Reginald McKenna until a permanent Chairman could be appointed, has relinquished that position, but retains his seat on the board; and that the Marquess of Linlithgow has been elected Chairman of the company, and of the Midland Bank Executor & Trustee Co. Ltd.

We regret to record the death on January 27, at the age of 76, of Mr. Percy Frederick Hodgson, formerly Director & Works Manager of Saxby & Farmer Limited.

The board of Richard Thomas & Baldwins Limited announces that Colonel Sir W. Charles Wright, Lt.-Colonel J. B. Neilson, Sir Andrew Agnew, and Sir Robert Barlow have been appointed Directors of the company; and that Mr. T. F. Davies and Mr. F. S. Padbury have resigned from the board. Mr. Padbury remains Deputy-Chairman of the Grovesend Steel & Tinplate Co. Ltd. and a Director of certain other subsidiaries.

Mr. E. H. Lever (Chairman of Richard Thomas & Baldwins Limited) has been appointed a Director of Baldwins (Holdings) Limited.

G.N.R. (I.) APPOINTMENTS

The following appointments have been made by the Great Northern Railway (Ireland):—

Mr. W. Sandow to be Assistant Accountant.

Mr. R. K. Sharp to be Signal Superintendent, in succession to Mr. J. Potter, who has retired.

Mr. R. A. Nelis to be Agent at Belfast Passenger Station.

Mr. W. P. Sefton to be Chief Trains Clerk, Traffic Manager's Office.

Mr. C. G. W. Cordon, C.I.E., General Manager of the Madras & Southern Mahratta Railway since 1938, has returned home on leave, prior to retirement (as recorded in our November 10, 1944, issue). He started his railway career in 1902 on the former Great Northern Railway, and subsequently occupied various positions on the following overseas railways: Beira, Mashonaland and Rhodesia (1907-11); Lagos Government (1911-12); Cuban Central (1912-13). He joined the Madras & Southern Mahratta

Manager, are now appointed Joint General Works Managers. Mr. W. J. Clements is appointed Works Manager, Prescott Works.

The late Sir Clement Hindley, who was formerly Agent of the East Indian Railway, and afterwards the first Chief Commissioner of Railways in India, left £21,408.

We regret to record the death, at the age of 91, of Mr. J. R. Howard, formerly Chief Carriage Draughtsman, South Eastern & Chatham Railway, who retired in 1913.

Mr. W. R. Charlton, formerly Head of Passenger Train Section, Office of the Superintendent of the Line, Paddington, Great Western Railway, whose retirement at the end of last year was recorded in our January 12 issue, was presented on February 1, by Mr. Gilbert Matthews, Superintendent of the Line, with a cheque from his colleagues in the office.

The Minister of Production announces that Sir Nigel Campbell has asked to be relieved of his duties as Head of the Non-Munition Division of the Ministry and Chairman of the Non-Munitions Committee of the Commonwealth Supply Council, to be able to devote more time to his other interests. Mr. H. V. Hodson has been appointed to succeed him. Sir Nigel Campbell is Joint Deputy-Chairman of Stewarts and Lloyds Limited.

The Hon. W. E. Wylie, K.C., formerly a Director of the Dublin United Transport Co. Ltd., has been appointed Vice-Chairman of the Irish Transport Company. Mr. Wylie is a former chairman of the Irish Railway Wages Board.

Mr. W. T. James has been appointed Chairman of East Midland Motor Services Limited, in succession to Mr. J. S. Wills, who has resigned from the board owing to pressure of his other duties. Mr. Raymond W. Birch fills the vacancy in the directorate.

Mr. D. S. Bennett has been appointed a Joint Managing Director, with Mr. George Terrell (the present Chairman & Managing Director) of Tyer & Co. Ltd. Mr. Bennett previously was associated with the Westinghouse Brake & Signal Co. Ltd. Mr. J. Punter, who has been a Manager of Tyer & Co. Ltd. for 38 years, has retired from that position, but retains his seat on the board. Tyer & Co. Ltd. is approaching its centenary.

L.M.S.R. STAFF CHANGES

The following staff changes are announced by the L.M.S.R.:—

Mr. R. Worboys, District Foreman, Carriage & Wagon Department, Larkfield, to be District Foreman, Carriage & Wagon Department, Manchester (Ashton Road), in place of Mr. H. Harper, retired.

Mr. W. L. Bonsall, District Foreman, Carriage & Wagon Department, Stoke, succeeding Mr. R. Worboys as District Foreman, Carriage & Wagon Department, Larkfield.



Mr. C. G. W. Cordon

Agent & General Manager, Madras & Southern Mahratta Railway, 1938-44; General Manager, 1944-45

Railway in May, 1914, as Assistant Traffic Superintendent. During the 1914-18 war he served on railways with the Mesopotamia Expeditionary Force. Rejoining the M.S.M.R. after the war, he was appointed District Traffic Superintendent, and then Deputy Traffic Manager, Commercial & Movement. He also held the posts of Statistical Officer, Chief Controller of Stores, Deputy General Manager, and then Chief Commercial Manager. He was appointed Agent & General Manager in 1938. In 1937 he officiated as Director of Traffic, Railway Board, and subsequently was placed on special duty in the office of the Board in connection with the report of the Indian Railway Inquiry Committee. Mr. Cordon was President of the Indian Railway Conference Association, 1943-44, and was made a C.I.E. in the Birthday Honours in 1942.

British Insulated Cables Limited announces that Mr. N. K. Bunn, Works Manager, and Mr. J. L. Harvey, Production

We regret to record the death on January 25, at the age of 77, of Mr. Andrew Custance Carr, V.D., M.I.Mech.E., M.I.Loco.E., formerly Chief Mechanical Engineer, and for a time Acting Agent, of the Bengal-Nagpur Railway, and until recently a Partner in the firm of Messrs. Wolfe Barry, Robert White & Partners, Consulting Engineers. Mr. Carr received his early training with the former North Eastern Railway. In 1892 he joined the East Indian Railway, and subsequently occupied, successively, the positions of District Locomotive Superintendent, Works Manager, and Deputy Locomotive Superintendent. He transferred to the Bengal-Nagpur Railway in 1905, and be-

came Deputy Chief Mechanical Engineer & Works Superintendent at Khargpur. In 1909 Mr. Carr visited the principal railway workshops in Canada and the U.S.A., and in 1912 he was appointed Chief Mechanical Engineer, Bengal-Nagpur Railway. He was Chairman of the Locomotive, Carriage & Wagon Superintendents' Committee of the Indian Railway Conference Association during its 1917-18 session; subsequently his services were lent to Great Britain, and in 1918-19 he was General Manager of the Coventry Ordnance Works. After the cessation of hostilities Mr. Carr returned to India, and in 1920 was appointed to act as Agent of the Bengal-Nagpur Railway. After his return to England at the end of 1921 he became a Partner in the firm of Sir John Wolfe Barry & Partners (now Messrs. Wolfe Barry, Robert White & Partners); he retired from his partnership on December 31, 1944. He was President of the Institution of Locomotive Engineers, 1935-36.

We regret to record the death on February 2, at the age of 52, of Mr. Percy Pritchard, Deputy-Chairman & Joint Managing Director of Birmid Industries Limited.

We regret to record the death on January 29, at the age of 92, of Mr. James Stranack Gaskell, M.Inst.C.E., formerly an Executive Engineer on the construction of the Assam-Bengal Railway.

Brigadier A. E. M. Walter, Royal Engineers, has been made a C.B.E. in recognition of gallant and distinguished services in North West Europe.

We regret to record the death, as a result of the railway accident which occurred outside Kings Cross Station on February 4, of Mr. Cecil Kimber, a Director of Specialloid Limited.

Mr. F. C. Wilson, M.B.E., who, as recorded in our January 26 issue, has retired from the position of District Superintendent, Stratford, L.N.E.R., joined the former Great Eastern Railway as a junior clerk

Romford, and the Norfolk & Norwich Hospital, Norwich. He is an Honorary Life Member of the British Red Cross, and a Serving Brother of the Order of St. John of Jerusalem.

Mr. Clement G. Hodgson, O.B.E., M.I.Mech.E., whose death, in his 70th year, was recorded briefly in our December 29, 1944, issue, was formerly Chief Mechanical Engineer of the Sudan Government Railways, and afterwards Advisory Engineer from 1924 to 1932; he was then Consulting Engineer to the Sudan Government until the time of his death. He was born in County Durham, and received his engineering



The late Mr. A. C. Carr [Elliott & Fry]

Chief Mechanical Engineer (latterly Acting Agent), Bengal-Nagpur Railway, 1912-21; lately a Partner, Messrs. Wolfe Barry, Robert White & Partners



Mr. F. C. Wilson

District Superintendent, Stratford, L.N.E.R., 1933-45



The late Mr. C. G. Hodgson

Formerly Chief Mechanical Engineer, Sudan Railways; afterwards Consulting Engineer to the Sudan Government

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and gained clerical experience at various stations until 1905, when he was specially selected as G.E.R. Passenger Agent at York. In that position he gained a wide knowledge of the many phases of operation. Thereafter he was Stationmaster at various stations until, in 1915, he became Assistant Stationmaster, Liverpool Street, taking charge also of locomotive running there in 1919. In 1923, Mr. Wilson was promoted to be Stationmaster at Norwich (Thorpe), including charge of passenger and goods working, Crown Point marshalling yard, Trowse and Norwich (Victoria). In 1927, he returned to Liverpool Street as Stationmaster. He was promoted to be District Superintendent, Norwich, in 1930, and was appointed District Superintendent, Stratford, in 1933. Mr. Wilson was made M.B.E., in the King's Birthday Honours, 1942, for his work in the air raids of 1940-41, when in ten weeks the Stratford district had the main lines damaged no fewer than 74 times. Mr. Wilson is Chairman of the committee of management of the United Kingdom Railway Officers' & Servants' Association. He was Chairman in 1944 of the London Inter-Railway Operating Conference (consisting of the London divisional and district officers of the four main-line railways and the L.P.T.B., controlling the London exchange junctions). Mr. Wilson is a Life Governor, and a member of the committee of management, of Queen Mary's Hospital for the East End, Stratford; and a Life Governor of the London Hospital, Connaught Hospital, Walthamstow, King George's Hospital, Ilford, Victoria Hospital,

training with Manning, Wardle & Co. Ltd., of Leeds, with which he served until he went to the Sudan as an engineer in the Locomotive Department of the Sudan Military Railway in November, 1898, immediately after the reconquest of the Sudan by Anglo-Egyptian forces under Lord Kitchener. The base was then at Wadi Halfa, and the railway ran as far as Khartoum only. He became Assistant Works Manager at Wadi Halfa in 1900, and was promoted to be Works Manager in 1901, and Locomotive Superintendent in 1904. About that time the project for a railway from the Red Sea to the Nile was inaugurated; and the line was completed in 1906. In 1912 the Nile was bridged at Khartoum, and the railway was extended to El Obeid; in that year Mr. Hodgson's title was changed to that of Chief Mechanical Engineer, which post he filled until his retirement from the Sudan in 1921. Mr. Hodgson was a Director of Millars' Timber & Trading Co. Ltd. and other companies. Some account of the development of the Mechanical Department of the Sudan Railways, during Mr. Hodgson's control, is given in an editorial note elsewhere in this issue.

We regret to record the death on February 2, at the age of 71, of Mr. Frederick Robert Stephen Balfour, C.V.O., D.L., J.P., a Director of Cable & Wireless (Holding) Limited, and associated companies, and of Cable & Wireless Limited, and associated companies.

TRANSPORT SERVICES AND THE WAR—280

Out-of-Gauge Loads

Tanks, guns, boats, and armour plates were among the 10,000 "out-of-gauge" loads carried on the L.M.S.R. during 1944. For such consignments the path of the train has to be plotted to avoid trains on adjacent lines, and an inspector has to examine the load every 25 miles.

All-Day London Tickets for Forces

More than 2,000,000 All-Day 1s. tickets have now been supplied by London Transport to H.M. & Allied Forces. These well-known red, white, and blue tickets were introduced in November, 1940, for use on the London Transport system by Service personnel on leave in London. They are issued mainly from Service Clubs and at certain London Transport stations in the Central London Area.

Liverpool Road Transport Control

Pursuant to Section 236 of the Companies Act, 1929, a general meeting of the members of the Port of Liverpool Road Transport Control Limited will be held at 14, Tithebarn Street, Liverpool 2, on March 7, at 3 p.m. for the purpose of having an account laid before them, showing the manner in which the winding-up has been conducted and the property of the company disposed of. It may be recalled that on page 233 of *The Railway Gazette* for August 30, 1940, it was recorded that a private company under this title was incorporated on August 16, 1940, with a nominal capital of £500 in £5 shares, to act as controller of dock and road traffic in South-West Lancashire, Wirral, and Merseyside, in collaboration with the Ministry of Transport, the Mersey Docks & Harbour Board, and other public authorities.

Improved East Anglian Train Services

On Monday last, February 5, the L.N.E.R. introduced a number of improved East Anglian services to and from Liverpool Street. These improvements are designed mainly to alleviate overcrowding caused chiefly by the lifting of the coastal ban, and also to meet demands for better business services so far as present circumstances permit.

The 5.46 p.m. from Liverpool Street to Norwich and the 5.50 p.m. from Liverpool Street to Hunstanton now run every weekday, instead of Mondays and Fridays only as before. The 6.8 p.m. (Saturdays excepted) from Liverpool Street to Southend now leaves at 6.4 p.m. and has been speeded up; the stops at Romford and Gidea Park are omitted, but passengers for these places are able to catch a new train leaving Liverpool Street at 6.8 p.m. (Saturdays excepted) for Gidea Park, with intermediate calls at Stratford and Romford.

Passengers for Yarmouth (South Town) and Lowestoft (Central) who previously had no later train from Liverpool Street than the 5.6 p.m., can now leave at 7.30 p.m. on the Ipswich train, which has been extended to Yarmouth and provides connections to Lowestoft.

In the reverse direction the 12.20 p.m. from Lowestoft (Central) to Beccles now leaves at 12.15 p.m. and is extended to Liverpool Street, arriving at 3.56 p.m.

There are two additional trains from Ipswich to London. The first leaves at 12.20 p.m., calls at Colchester, Witham, and Chelmsford, and arrives at Liverpool Street at 2.18 p.m.; the second leaves at 3.10 p.m., calls at Colchester and Marks Tey, and reaches Liverpool Street at 5.15 p.m.

Sunday travellers from Cambridge to London now have the advantage of an additional train which, leaving at 9.15 a.m.,

calls at all stations to Bishops Cleeve and then runs non-stop to Liverpool Street, arriving there at 11.12 a.m.

Rome-Naples Train Service

Although a railway link between Rome and Naples has been open for many months, until recently it has been used almost exclusively for military supplies. A public train service was begun on January 23, and on the first trip the train used the coastal (*Direttissima*) line, but the regular service is intended to use the inland line through Cassino and Frocinone. An American soldier drove the locomotive of the inaugural train on January 23. Ordinary civilian traffic had been suspended since September, 1943.

Swedish Locomotives for Holland

The first of a series of locomotives ordered in Sweden by the Netherlands Government was recently completed, and was delivered to the Dutch Minister in Stockholm, on December 18 last, as we recorded briefly in our December 29 issue. This order, which was placed with Nydqvist & Holm of Trollhättan, comprises in all 50 locomotives 35 of which are of a relatively large type, weighing 95 tons, and intended for goods traffic. The remaining 15 will be built for fast passenger train service. The locomotive recently delivered is the first one built in Sweden to be equipped throughout with roller bearings of S.K.F. make.

Resumption of Rail Traffic between Divonne and Switzerland

Rail traffic between Divonne (in France, west of Geneva) and Nyon was resumed on November 18. In France, this standard-gauge steam-operated line is worked by the Société des Messageries et Transports Automobiles des Monts Jura à Besançon, which also maintains road services between Divonne and Bellegarde. The line begins near Bellegarde, joining the Geneva-Bellegarde main line at Collonges-Fort l'Ecluse, 6 miles to the north of Bellegarde. During most of the German occupation of France there was only one daily train in each direction between Collonges and Divonne, and latterly this service was reduced to four trains a week (Monday, Tuesday, Thursday, and Friday) in each direction. Divonne-les-Bains in peacetime is a fashionable health resort. During the occupation its many hotels served as military hospitals and convalescent centres for the German Forces. On the Swiss side of the frontier, the line is owned and operated by the Swiss Federal Railways. The frontier line runs through Crassy village (Crassier-la-Rippe) which is partly in France and partly in Switzerland. The Germans removed several lengths of rail on French territory just beyond the frontier.

Resumption of Rail Traffic between Paris and Switzerland

The first efforts to resume main-line railway connections between France and Switzerland, made by Switzerland early in November, 1944, mainly in the interest of the Swiss transit traffic to and from Spain, via southern France, did not succeed. Subsequently, a regular daily railway connection between Paris and Switzerland, via Dijon, Pontarlier, and Les Verrières, was arranged for passenger traffic only, and was instituted on December 1 last. Reference to this was made in our December 15 issue (page 606). A correspondent in Switzerland has now sent us the following additional particulars.

In France the service is operated by a railcar from the Gare de Lyon, Paris. As the direct main line between Paris and Dijon is not available, either because it is

still under repair or because it is reserved exclusively for military purposes, the service uses the roundabout route via Montargis and Nevers, and reaching the Lyons-Dijon main line at Chagny. Thus the distance from Paris to Dijon is 291 miles instead of the 196 miles of the direct line. There is an overnight stop both ways at Dijon. As the hotels at Dijon seem to be either destroyed or reserved for official purposes, two sleeping cars of the Compagnie Internationale des Wagons Lits et des Grands Express Européens have been placed at the disposal of passengers at Dijon Station. The total distance between Paris and Les Verrières (Switzerland), via Nevers, Dijon, Dole, and Pontarlier, is 384 miles. The French frontier station is Les Verrières de Joux, one mile to the west of Les Verrières. Connection in Switzerland is by ordinary services of stopping trains between Les Verrières and Neuchâtel. From the latter place the connection with Berne is also by stopping trains. Immediate connections are available at Neuchâtel for southern or northern Switzerland by stopping trains, but in the reverse direction there are fast train connections. The first timetable between Paris, Les Verrières, and Berne was as follows:—

dep. 9.50 a.m.	Paris, Gare de Lyon	arr. 5.55 p.m.
arr. 6.10 p.m.	Dijon	dep. 9.45 a.m.
Overnight stop		
dep. 8.15 a.m.	Dijon	arr. 7.5 p.m.
arr. 10.17 a.m.	Frans	dep. 5.4 p.m.
dep. 10.18 a.m.	Frans	arr. 5.2 p.m.
arr. 10.35 a.m.	Pontarlier	dep. 4.45 p.m.
dep. 11.5 a.m.	Pontarlier	arr. 4.15 p.m.
arr. 11.25 a.m.	Les Verrières-Suisse	dep. 3.55 p.m.
dep. 12.44 p.m.	Les Verrières-Suisse	arr. 3.20 p.m.
arr. 1.50 p.m.	Neuchâtel	dep. 2.8 p.m.
dep. 2.25 p.m.	Neuchâtel	arr. 1.46 p.m.
arr. 3.27 p.m.	Berne	dep. 12.37 p.m.

Although the French frontier station is Les Verrières de Joux, the passport and luggage examination takes place at Pontarlier. The Swiss examination is at Les Verrières-Suisse. Usually, only six seats in the French railcar are reserved for passengers to and from Switzerland.

The Belgian Railways under the Occupation

The year 1943, which was the last complete year of the German occupation of Belgium, finished with the Belgian National Railways Company having 4,757 km. (2,954 miles) of line open for traffic, or very little less than the route mileage of 3,005 miles (4,839 km.) it had at the end of 1938. The reconstruction of the railway lines and installations destroyed during the fighting in 1940 was nearly complete by the end of 1942. The working of the railway services had been resumed by the Société Nationale des Chemins de Fer Belges in the second half of 1940, although it had been placed under the supervision of the Germans, affected their Chief Traffic Management (*Hauptverkehrsleitung*) at Brussels. The chief task of this management was to secure the smooth running of all the transport on behalf of the German Forces, and the German work of fortification in Belgium and Northern France. It is reported that all these transport tasks were effected satisfactorily.

The main traffic flow of the Belgian railways was necessarily diverted from its general pre-war direction between the interior and the maritime ports, as all seaborne traffic was discontinued. The principal traffic then flowed between Belgium and Germany, entailing a longer turn-round of goods wagons. This was followed by additional traffic demands as road motor traffic virtually ceased as a result of shortages of tyres, motor fuel, and lubricants. A large proportion of the Belgian stock of railway goods wagons was retained in Germany to relieve shortages in the Reich, and the loading space available for purely

Belgian requirements was cut to the minimum.

Belgian industry was compelled to work in the interests of the Germans, and transport in this connection is said to have operated smoothly and efficiently after block trains composed of high-capacity wagons had been put into service operating shuttle services between the mining areas and the metallurgical works. The use of these high-capacity wagons, often owned by the metallurgical works concerned, was controlled by the Brussels Traffic Management jointly with the Saarbrücken Reichsbahn Management.

As was to be expected, passenger traffic fell far short of pre-war figures. In 1943, the number of passenger trains was reduced to about 40 per cent. of the pre-war total. Despite this, the restrictions in the passen-

ern France in conjunction with the Chief Belgian Traffic Management referred to above. Measures to expedite the turn-round of wagons, particularly by reducing the loading and unloading times and substantially increasing demurrage charges, were introduced by the Germans. A further acceleration of goods traffic between Belgium and Germany resulted from the abolition of the German import and export duties, decreed by the Reich Minister of Finance on November 25, 1942.

Cleaning German Goods Wagons

German recipients of wagon loads now have to provide for cleaning the wagons. As the observance of this rule has been found to entail delays, a fine of RM.20 is imposed for every wagon not promptly cleaned after unloading by consignees. The new rule, which became effective on

have been increased by 33 to 35 per cent. Luggage and express goods rates have been advanced 100 per cent., but decrease on a distance-zone basis to 24 per cent. The increase in goods rates amounts to one Krona per 100 kilogram, with certain exceptions such as bulk goods. Thus, the increase in the coal rate is 30 haller (K. 0.30) per 100 kg., and ore rates are higher by 20 haller per 100 kg.

Record Coal Handling

A war record in U.S.A. coal handling has been established by the Pennsylvania Railroad at its Sandusky Docks on Lake Erie, where the handling facilities have been expanded lately. In October last, the total of 2,200,736 tons transferred from coal wagons to ships was the largest ever handled in a single month at any port on the Great Lakes. In the ten months up to the end of October, the total weight of coal passing through Ohio port had reached 12,886,018 tons. The record day was October 25, when in 24 hr., 2,071 full wagons of coal were dealt with, and the contents shipped. All the wagons were of the customary American bogie type, with capacities averaging 60 tons. All the tons quoted were the usual American ton of 2,000 lb.

Inadequate U.S. Railway Signalling

The Interstate Commerce Commission has called upon the New York Central System, as lessee of the "Big Four" (the Cleveland, Cincinnati, Chicago & St. Louis Railroad) to file a formal return showing cause why the latter should not instal, on five specified sections of its Ohio Division, "a suitable block signal, automatic train control, cab signal, or other system to provide increased protection." The line concerned is the main New York Central route from New York and Cleveland to Cincinnati and St. Louis, used by a number of very fast trains. The I.C.C. Order was issued after the investigation of a derailment at Deer Creek, Ohio, on April 7 last, when a train was derailed through entering an open switch at high speed, and the I.C.C. report stressed the fact that this was but one of a number of points on the Ohio Division on which trains were operated at high speed over facing-points, and at which protection was inadequate, especially in view of the density of wartime traffic.

A New Canadian Orefield

Shipment of the first 1,400 tons of iron ore from Steep Rock Lake, Ontario, 150 miles south-west of Port Arthur, gives evidence of the completion of a remarkable piece of development work in Canada. When iron ore was first discovered under the bed of this lake, it was estimated that three years would be needed in which to instal the plant necessary for its recovery, but actually, under pressure of wartime demand, the work has been completed in half that time. It has included the draining of two smaller lakes, the reversal of the course of the flow through another, and the draining of some 72,000,000,000 gal. of water from Steep Rock Lake itself, which is 15 miles long. Specially-designed equipment has been needed to raise the ore from the lake bottom and transfer it to the wagons; and 23 miles of new railway line to connect the mine with the nearest section of the Canadian National Railways. Authority was given by the Canadian Government for this new construction, and for the building of a modern ore-loading dock at Port Arthur, to handle the transfer of ore from railway wagons to the ore-boats on Lake Superior. A train of 27 bogie ore hoppers handled the first 1,400-ton load, and for the present one trainload daily will be sufficient to deal with the output, but it is expected that production later will rise to 5,000,000 (short) tons annually.



A railway carriage village in Western Germany to give shelter to some of the tens of thousands of bombed-out persons. These "villages" of disused railway rolling stock, mostly goods vehicles, are said to have been assembled in large numbers. The wagons are placed in parallel "streets" as shown here, and are used with very few alterations

ger traffic were not so drastic as in many other German-occupied countries. The curtailments were more severe with long-distance trains, but suburban and local traffic, in a country so highly industrialised and so densely populated as Belgium, could not be reduced to the same extent without impairing industrial working in the interest of the Germans, as considerable numbers of workmen had to rely on railway services for their conveyance between home and work. Leave traffic of Belgian and French workers in Germany was a further heavy responsibility of the Belgian railways in 1943. Fares and rates were not increased in 1943. The last increase in the passenger fares, one of 20 per cent. excluding workmen's fares, was made on June 1, 1942.

Apart from emergency repairs to lines, plant, and buildings devastated during the 1940 fighting, railway building activity was reduced to the minimum in view of shortages of materials and labour. Work on the Brussels Nord-Midi connection, as well as the preliminary work for the electrification of the 35-mile Brussels (Midi)-Charleroi (Sud) line, had to be discontinued not being in the "interest of the war effort."

To co-ordinate the entire transport requirements of German-occupied Western Europe, the Germans in 1942 established in Paris their Chief Traffic Control Management France-Belgium (*Hauptverkehrs-leitstelle*), in which Belgium was represented by the German Military Commander (*Militärbefehlshaber*) for Belgium and North-

August 20, 1944, provides: "Fully-laden wagons which have to be unloaded by consignees must be returned 'broom-proof' (*besenrein*) and free from nails, fixing wires, and other means for fastening goods, unless the wagons are required to be cleaned and disinfected by the railway authorities in accordance with veterinary rules and provisions. For any wagon which a consignee returns in a dirty state, a 'cleansing fine' (*Reinigungsbusse*) of RM. 20 must be paid. If because of veterinary rules or provisions the railway authorities must clean and disinfect a wagon, the railway is entitled to a fee in accordance with the published rates."

Norwegian Railway Nationalised

According to a recent report from Norway, the Urskog-Hölands Railway, with a route length of 57 km. (35 miles), has been nationalised. The railway extends from Sørumsand (on the Norwegian State Railways, east of Oslo) to Skulerud, near the Swedish border. It is of 75 cm. (2 ft. 6 in.) gauge. The line is said to be of importance to the Germans from the viewpoint of "transit traffic."

Railway Fare Increases in Slovakia

Railway fares and goods rates in Slovakia were increased substantially on December 1. Increases in passenger fares vary between 25 and 150 per cent.; workmen's fares are excepted. Basically the passenger-fare increase is 81 per cent., reducing as the distance lengthens. Fast-train supplements

Military Railway Achievements in Western Europe

Some notes on a press conference with the Chief Engineer, Supreme Allied Headquarters

Major-General Cecil R. Moore, Chief Engineer, Headquarters, European Theatre of Operations, U.S.A. Forces, in a recent press conference, expressed his belief in early reconnaissance as an invaluable time-saver. He said they were making extensive use of planes for this purpose on the engineering side, and that he, personally, had made low-level reconnaissances of almost all the railways they were then developing. Slow planes flying at from 50 to 100 ft. made it possible to note the precise condition of the formation, and the damage and bridge repairs required. This enabled the whole job to be taped accurately in the minimum of time, and the correct number of men and equipment of the right kind and quantity to be put to work immediately.

After describing the laying of a pipeline, he remarked that the excellent work of the R.A.F. and A.A.F. in destroying railway yards, bridges, and rolling stock was responsible for most of the Allies' railway restoration work. Our destruction of the French railway communications was so thorough that the Germans eventually gave up trying to repair them, and there was no doubt that it had a decisive effect on their ability to repel the invasion.

General Moore then described what he considered the most dramatic railway reconstruction work. After the break-

through had occurred, Allied troops were pouring through the Avranches—Coutances tunnel into France and towards Paris, and the difficulty was to keep the fast-moving spearhead troops supplied. General Patton accordingly asked for the railway to Le Mans and Laval to be reopened within 48 hr. It necessitated (a) the rebuilding of seven bridges in various stages of demolition; (b) the repair and laying of completely new main lines in three yards, together with many miles of new track in the approaches to these yards and the bridges within the target area; and (c) the provision of new watering and other facilities to replace those demolished.

The two general service regiments on the spot were immediately reinforced by three others and all the heavy equipment—even though in use on almost equally urgent jobs—that could possibly be spared was rushed to the bridges and yards. While this was going on, engineer officers in tents were designing the new bridges. Within 48 hr. supply trains were moving across the last bridge, the result of super-rapid planning, first-rate team-work, and non-stop night and day working.

General Moore also explained the difficulties encountered in providing Cherbourg with adequate rail communication with France generally. The main line towards Paris had to carry not only the American

traffic from that port, but also British traffic from the Caen direction, once it was repaired. Consequently, the secondary lines through St. Lo, Coutances, and Vire had to be used, and they were single lines with heavy gradients. Reconstruction was, therefore, difficult and involved the rebuilding of many bridges.

Experience gained in North Africa and Italy proved invaluable in France. Although the exact point of attack there was unknown, railway bridging materials were ordered two years previously for "North-Western Europe." The investigations of those responsible showed that for that wide area an average of 30 ft. of bridging would be required per mile of line. When the actual assault area became known, it was found that this figure was on the high side. To suit conditions in France, special equipment such as switches, crossings, erection plant, and water supply materials, had to be ordered after those conditions had been studied carefully. Ample supplies had to be ready to replace demolished or otherwise damaged material, and, similarly, stocks of spares of all kinds had to be provided to suit European equipment. Actually, the rapid German retreat restricted their demolitions, and prevented them from removing vast quantities of supplies and equipment, so that the main task was to restore what Allied airmen and artillery had demolished. Excellent co-operation by the French assisted greatly at all times, and, in return, the Allies had done all they could to assist the French in solving their problems and in restoring civilian economy.

50 MILES AT A GLANCE

This chart maps the 50-mile network of tracks controlled by Tower X. Electric lights show the movement of every train.

CIRCUIT SLEUTH

A Signal Maintainer is on duty in every large New York Central tower, constantly checking the hundreds of electric circuits and keeping equipment in perfect order.

MISTAKE-PROOF MACHINE

This electric signal machine is typical New York Central tower equipment. Controls are so "interlocked" that conflicting routes cannot be set up.

MASTER STRATEGIST

On the Tower Director's quick thinking depends the smooth flow of war-time traffic over this portion of New York Central. He "calls the routes" for the Levermen to set up.

ALL EYES AND EARS

The Operator notes on his TrainSheet the time each train passes, and reports to the Dispatcher. He also watches and listens to check the operation of each train, and then signals to the rear brakeman.



New York Central

ONE OF AMERICA'S RAILROADS—ALL UNITED FOR VICTORY



BUY MORE WAR BONDS

"POST-WAR" TOWER TODAY!

This "electric brain" is already at work in New York Central's latest tower. It automatically selects routes, sets switches and signals at the touch of a button!

A further example of an interesting series of advertisements issued by the New York Central system

Belfast Railway Accident

Inquiry opened

From our Belfast correspondent

The inquiry into the accident on the Bangor line of the Belfast & County Down Railway was opened in Belfast on January 29 by Mr. R. D. Duncan, Inspector of Railways in Northern Ireland. After hearing statements, he decided to take the evidence in private. His report to the Northern Ireland Ministry of Commerce will be published in due course.

Mr. H. S. Knott, Traffic Manager, said that the 7.10 a.m. train from Bangor, consisting of 13 six-wheel coaches of a total unladen weight of 269 tons, left Bangor 1 min. late, and 2 min. were lost in running to Victoria Park Halt, the last scheduled stopping point. All signals on the journey were clear up to and including Sydenham stop and the train was brought to a stand on the Sydenham side of Ballymacarrett Halt, before a white circular marker situated 79 yd. in rear of the Ballymacarrett Junction up branch outer home signal, which was at "danger."

That, said Mr. Knott, was in accordance with the laid down instructions which were designed to prevent trains being stopped at the short halt platform. About 3 min. afterwards the collision took place.

The 7.40 a.m. train from Holywood, consisting of one bogie and two six-wheel coaches, total unladen weight 104½ tons, was worked as a propelled train with the driver travelling in his driving compartment in the leading bogie coach. That compartment was provided with apparatus for controlling the engine regulator, the vacuum brake, the hand brake, and the engine whistle. The motor train arrived at Sydenham at 7.48 a.m. on time and as the stop signal was at "danger" the driver stated he waited the prescribed 2 min. and then proceeded under caution. The timetable stop was made at Victoria Park Halt to pick up and let down passengers. Shortly after leaving that point the collision with the rear of the other train occurred.

The Bangor train, said Mr. Knott, had a seating capacity of 724 and conveyed approximately 600 passengers. The Holywood motor had a seating capacity of 186 and was approximately filled leaving Victoria Park Halt.

Describing the signalling arrangements on the Bangor branch, Mr. Knott said it was the automatic type from Bangor West to Ballymacarrett and the first manually-operated stop signal on the up direction was the Ballymacarrett up branch outer home signal which was situated at the Belfast end of Ballymacarrett Halt up platform. That signal was fitted with an automatic "reverser," which restored it to "danger" when the engine had passed it.

The signal and "reverser" worked satisfactorily for the passing of the 6.40 a.m. and the 7 a.m. trains from Bangor, but when the signalman attempted to lower the signal for the 7.10 a.m. from Bangor, the repeater in the signalbox disclosed that the signal had not come "off." After making several unsuccessful attempts to pull off that signal the signalman left the signalbox to proceed to the train to hand signal it forward, but he had not gone far from his box when he heard the collision occur. He thereupon returned to his signalbox.

Mr. Knott explained that in normal working when it had been necessary to

hold trains at Ballymacarrett Junction up branch outer home signal to allow main-line trains to pass over the junction, a second train had followed into the Sydenham-Ballymacarrett Junction section under caution in accordance with the "stop-and-proceed" rule.

There were patches of fog between Sydenham and Ballymacarrett Halt on the morning of the accident (January 10), but the driver of the 7.10 from Bangor stated that he was able to see the Ballymacarrett Junction up outer home signal at a distance of about 150 yd., and brought his train to a stop before the marker.

The driver of the 7.40 a.m. from Holywood, Mr. Knott proceeded, stated that he ran into a patch of fog shortly after leaving Victoria Park Halt and did not observe the tail-light of the preceding train until he was about 30 yd. away. After the collision the signalman at Ballymacarrett Junction signal-box telephoned Sydenham Station to detain the 7.35 a.m. from Bangor, and the fireman of the 7.40 a.m. from Holywood walked back to Sydenham station to protect the obstruction and to warn the trainmen of the 7.35 a.m.

Questions in Parliament

Restaurant Car Facilities

Mr. N. B. Goldie (Warrington—C.) on February 1 asked the Parliamentary Secretary, Ministry of War Transport, whether he was in a position to announce a date for the restoration of restaurant car facilities on long-distance trains to and from London.

Mr. Noel-Baker stated in a written answer: I am afraid I cannot say when it will be possible to restore restaurant cars on long-distance trains.

Parents' Travel Facilities

Mr. W. J. Edwards (Stepney, Whitechapel & St. George's—Lab.) on February 1 asked the Parliamentary Secretary, Ministry of War Transport, if he was aware of the great hardship imposed on parents of evacuated families through the curtailment of cheap travel vouchers from one parent per month to one for each parent every two months; and if he would restore it to one per parent per month.

Mr. Noel-Baker stated in a written answer: I regret that, in present conditions, I should not be justified in authorising an increased number of journeys at reduced fares, even for parents visiting their evacuated children.

Income Tax Deduction

Sir Charles Edwards (Bedwelty—Lab.) on January 25 asked the Secretary to the Treasury whether he was aware that the inland revenue authorities had instructed the Great Western Railway Company to pay Mr. W. Clements, 21, Sarn Place, Risco, Monmouthshire, a railway guard, the sum of £3 a week only, to take the rest for income tax to repay an alleged debt of £6 10s. for his daughter keeping house for him; that this man paid 17s. 6d. weekly to his wife who was in a mental home at Caerleon, Monmouthshire, leaving him only 42s. 6d. a week to maintain his home and his daughter; and, as a letter was received from the Treasury stating that the alleged debt for his daughter would be waived, would he make further enquiries into this case.

Mr. Osbert Peake (Financial Secretary to the Treasury) in a written answer stated: I cannot deal with the application of the

income tax law in particular cases by way of question and answer, and I would remind Sir Charles Edwards that this is a case in which he already has received from me a full explanatory letter. If he considers that there is any further point which is not covered by that letter and will communicate it to me, I will cause enquiry to be made and let him know the results in due course.

Mr. W. A. Hill, Engineer, having referred to the system of signals, said that when the Holywood signal cabin was operating automatically a train leaving Holywood set the signals in advance if the line were clear. When the train reached the 2½-mile post near Sydenham it operated an indicator in Ballymacarrett cabin, giving the signalman visual and audible signs by means of an indicator and buzzer of approach of the train. That warning continued until the train reached Victoria Park Halt, when a second indicator was operated which stopped the first indicator.

Mr. Hill said that the Sydenham up stop signal, which was in effect the Sydenham up starter, had a fixed "A" sign and did not show a clear aspect unless the track was unoccupied between Sydenham and Ballymacarrett Junction up branch outer home signal.

Inland Waterways and Canals

Mr. Ellis Smith (Stoke—Lab.) on January 31 asked the Parliamentary Secretary to the Ministry of War Transport if he could state the amount of tonnage carried annually on the Manchester Ship Canal and the average on our inland waterways; and if he had any comparable figures for the Dortmund-Ems and Albert canals.

Mr. P. J. Noel-Baker (Joint Parliamentary Secretary, Ministry of War Transport) stated in a written answer: About 7,500,000 tons of traffic a year is carried on the Manchester Ship Canal, and 11,250,000 tons on the other inland waterways in Great Britain. The traffic on the southern section of the Dortmund-Ems Canal (Bergesehoyed-Betteln) is estimated to have increased from 1,000,000 tons a month before the war to 2,000,000 tons a month in June, 1944. The traffic passing Hasselt on the Albert Canal amounted to 3,500,000 tons in 1936. It is estimated that about the same tonnage may have passed last year.

Mr. Ellis Smith on January 31 also asked the Parliamentary Secretary to the Ministry of War Transport if he would make a full statement on the negotiations that had taken place with the canal companies over the financial arrangements with controlled undertakings; who took part in the negotiations; which companies had rejected the proposals; and on what grounds.

Mr. Noel-Baker in a written answer stated: Forty-one canal undertakings are controlled by the Government. Financial terms have been agreed with 31 of them; negotiations with seven others are going on. The three remaining undertakings are the Grand Union Canal Company and its subsidiaries, the Grand Union Canal Carrying Company, and the Erewash Canal Carrying Company. These companies have rejected the Government's terms. I understand that they have done so because they

are not satisfied with the amount of the annual payment offered by the Government.

Public Relations Departments

Sir E. Graham-Little (London University—Ind.) on February 1 asked the Financial Secretary to the Treasury the number of persons now employed in the public relations and/or press department in every Government Department, together with the total cost of this provision.

Mr. Peake (Financial Secretary to the Treasury) stated in a written answer: The following table gives for all departments, other than the Ministry of Information, the particulars to which I referred in my reply on January 18. The totals are given in respect of whole-time staff, and include regional as well as headquarters staff. The figures for the Service Departments include home but not overseas commands. Most of the totals of annual cost are approximate.

Department.	Staff	Cost
		£
Admiralty	109	67,684
Ministry of Agriculture	65 (a)	23,200
Air Ministry	192 (b)	112,863
Ministry of Aircraft Production	29	10,361
Colonial Office	19	8,000
Dominions Office	8 (c)	3,370
Ministry of Economic Warfare	4	896
Ministry of Education	12	6,520
Ministry of Food	56	22,350
Foreign Office	10	9,510
Ministry of Fuel & Power	20	8,231
Ministry of Health	17	7,683
Ministry of Home Security & Home Office	15	8,712
India Office	20	8,889
Inland Revenue	2	1,945
Ministry of Labour & National Service	24	12,254
National Savings Committee	81	38,901
Ministry of Pensions	3	1,498
Post Office	12	8,839
Ministry of Production	14	7,420
Office of the Minister of Reconstruction	2	1,458
Ministry of Supply	121 (d)	48,600
Ministry of Town & Country Planning	12	7,785
Board of Trade	28	9,200
Treasury	1	1,090
War Damage Commission	2	1,218
War Office	280	120,000
Ministry of War Transport	15	6,902
Ministry of Works	5	1,912
Scottish Home Department	9	4,860
	1,187	£572,151

(a) This figure includes a staff of 52, costing £17,300 per annum, engaged upon informing and advising the farmers and domestic food producers through all available media on the best and most efficient methods of food production.

(b) The staff of the Photographic Dark Room (numbering 16) and of the R.A.F. Film Production Units (247 at home and 79 overseas) are partly engaged upon work of a public relations nature; but this varies with operational requirements and no estimate of the cost, and so on, can be made and particulars are therefore excluded from the above statement.

(c) Includes 3 engaged also on Colonial Office duties.

(d) Includes 58 staff (cost: £21,400) employed in the Publicity & Campaign Branch of the Directorate of Salvage and Recovery.

Parliamentary Notes

Railway Advertisements

In the House of Lords on February 1, Lord Mottistone asked the Government whether it could ensure that in all planning schemes adequate steps were taken to prevent the disfigurement of the neighbourhood by ugly signs or advertisements, and whether it would consider the introduction of such additional legislation as might be necessary for the powers needed for this purpose.

He said that most of the questions about advertising in a town were highly debatable. He could not hope to get the support of Lord Woolton to any plan to stop all advertisements, because nobody had used the advertising medium more fully, more successfully, and to the

greater advantage of everybody in this country than he had. Lord Woolton would say "No, we must not hamper advertising. It is a most valuable weapon for the Government, and as long as we have our present system, a most valuable method for all people who want to devise new and good things to sell to the public."

It had been suggested that among the offenders were the railway companies, which, of course, would say that they had nothing to do with the advertisements which disfigure the countryside all along the lines. That was so. He wished to pay tribute to the advertising of one of the railway companies because it was so entirely good. In their stations they had the most eloquent posters calling on everyone to see the English countryside. They showed original drawings and some reproductions from our great artists. A foreigner had said to him: "Among the most beautiful things I have seen in England are the railway companies' advertising posters in their stations, telling us to go and see the beauties of England, but no sooner do I go out into the country than I see the railway bridges covered with huge posters disfiguring the whole landscape." He was sure he was right in saying that the amount of revenue which the railway companies drew from advertising on their bridges was quite negligible. Lord Southwood pointed out to Lord Mottistone first that he was wholeheartedly with him in this matter, and secondly that there was a danger that all had observed from what was called fly posting. Lord Southwood thought that the law was not strong enough to deal with that. Lord Royden, Chairman of the Railway Companies' Association, was unable to be present at the debate, but he had asked Lord Mottistone to say, on his behalf, that he was wholeheartedly in favour of the Motion.

Lord Latham said that commercial art had made great advances in recent years, and indeed had made a contribution to the development of pictorial art. The Council of Art & Industry had done, and no doubt would continue to do, a good job in this direction, and he thought that no one would dissent from the view that the late Mr. Frank Pick, of the London Passenger Transport Board, had made a great contribution to the improvement of art in pictorial advertising.

Lord Lang of Lambeth said he fully recognised the place that advertisement had taken in our modern life, and he associated himself with what had been said about the railway companies. He thought there were few things more admirable than the advertisements in which the railways had employed first-rate artists to portray some of the scenes through which their lines passed. He thought there was every chance that there might be some success in a plea to the leading advertisers that they should content themselves with making use of the opportunities which they had already, to which no exception could be taken. There were the newspapers which now entered every house. There were, he would add, the railway stations because he could conceive hardly any distraction, however ugly, which would not be welcome to relieve the tedium of waiting for trains.

The Earl of Radnor said he was rather surprised that so much had been said about the railway companies, which in many ways were really very slight offenders in this matter. It was only with regard to railway bridges that they had any responsibility for advertisements in country districts. The advertisements

that were seen when travelling on the railways were no concern of the railway companies at all.

Lord Woolton said in his past life he had some concern with advertising and he had always made it a principle that he would never put an advertisement on a public building. He thought a good deal of the advertising which was deplored arose not as a result of deliberate policy, but from sheer thoughtlessness on the part of the advertising agents on the one hand and on the part of advertisers on the other. He could tell Lord Mottistone that provisions were included in the planning schemes for the control of advertising. He could not promise additional legislation in the course of this Parliament. He could say, however, that the Government was considering now whether new legislation was needed, and what the provision should be. He thought this debate had been useful from that point of view.

The Motion was by leave withdrawn.

ASSAM-BURMA FRONT COMMUNICATIONS

(Concluded from page 136)

geological formation as that of the hill section of the Assam-Bengal Railway.

After passing through Shingbuiyang, the Ledo-Burma road crosses the upper waters of the Chindwin and enters the Hukawng Valley near Maingkawng. From this point the alignments of the road and the proposed Indo-Burma Railway run almost side by side over the low (950-ft.) Chindwin-Irrawaddy watershed at Jam-bubum, there passing from the Hukawng into the Mogaung Valley. From Shazudup, just beyond the pass, the road keeps to the left of the valley, making directly for Mogaung, via Warong, whereas the railway trace follows the Mogaung River to Kamaing and then continues southwards to meet the existing Mandalay—Myitkyina section of the Burma Railways, between Taungni and Mogaung. From Mogaung the road proceeds to Myitkyina and, as just recently announced officially, has been completed as a new highway to this strategically-important town.

A further announcement by Admiral Lord Louis Mountbatten, Supreme Commander in South-East Asia, states that, not only is this road open for traffic, but that the continuation of it through Bhamo and Namkham to the Burma road at Wanting, on the China frontier, has been cleared of Japanese, and is passable for the transport of supplies from India to China. Doubtless the Myitkyina—Wanting section will have to be improved for heavy traffic in all seasons, but at this time of year it is evidently adequate for present requirements. This road, together with the fuel pipe-line, which is understood to be well advanced along the same general alignment, should greatly improve the supplies position in Western China. The road will carry heavy material that cannot go by air, and the pipeline will relieve both the air transports and the road of a large percentage of their traffics. The completion of these through road communications to supply China complies with one of the most important requirements of the famous Quebec Conference.

THE BUENOS AYRES & PACIFIC RAILWAY CO. LTD.—The address of the Buenos Ayres & Pacific Railway Co. Ltd. is now River Plate House, 10-11, Finsbury Circus, London, E.C.2.

Notes and News

Belfast & County Down Railway Company.—The ordinary annual general meeting of the Belfast & County Down Railway Company will be held at the company's terminus, Queen's Quay, Belfast, on February 22, at 11.30 a.m. The transfer books of the company will be closed on and from February 8, until after the meeting.

Argentine Export and Import Trade.—The export and import trade of Argentina in 1944, excluding bullion, totalled 3,360,035,000 pesos, compared with 3,134,312,000 pesos in 1943. Exports amounted to 2,352,881,000 pesos (2,192,264,000 pesos), and the value of imports was 1,007,154,000 pesos (942,048,000 pesos).

Thieves Cause Injury to L.M.S.R. Detective.—Detective-Sergeant Frank Worth, of the L.M.S.R. Police, was badly injured on January 26 while attempting to arrest thieves at St. Pancras. The driver of a van containing stolen parcels swung into Euston Road so quickly that the vehicle overturned. Sergeant Worth, who had jumped on to the running board, was pinned underneath. The two men escaped.

Post Office Record Business.—Post Office transactions with the public during the year ended March 31, 1944, reached the record high total of £2,427,783,000. Over 6,500,000,000 postal items were delivered, including 235,000,000 parcels. Registered letters and parcels amounting to 139,000,000 constituted another record. Over 200,000,000 postal orders and nearly 24,000,000 money orders were sold.

Australian Road Transport in 1945.—The Australian Minister for Supply & Shipping said recently that restrictions on the use of tyres, petrol and motor accessories were more likely to be tightened than eased in 1945. Tyres were the biggest problem. Rubber stocks were being steadily depleted. The introduction of synthetic rubber stocks would require much more care to obtain the most efficient pay-load mileage from each set of covers.

Accident to L.N.E.R. Locomotive "Mallard."—A Newcastle-Kings Cross express of the L.N.E.R. arrived in London about two hours late on February 6, because, according to press reports, of damage to side rods of Pacific locomotive No. 4468, *Mallard* (which was hauling the train), near Grantham, and which necessitated the substitution of an engine from Grantham at Great Ponton. The locomotive *Mallard* on July 3, 1938, attained a record for steam when it reached a maximum speed of 125 m.p.h.

Scottish Motor Traction Co. Ltd.—This company, in which the London Midland & Scottish and the London & North Eastern Railway Companies have each a large shareholding, reports that for the year ended October 31, 1944, the profit on operations, after providing for all charges, including depreciation, was £876,687 (£768,310), and dividends from subsidiaries, interest, etc., were £390,209, making £1,266,896. From this have been deducted £26,068 (£962,141) for income tax and E.P.T. and directors' fees £2,513, leaving a balance available of £338,615. Preference dividend (6½ per cent., less tax) requires £32,498 (same). Sums are allocated of £26,500 (£30,100) to deferred renewals reserve, and of £120,000 to general reserve, and £20,000 is written off goodwill. The dividend on the ordinary stock is again 8d. on each 5s. unit (or 13½ per cent.) free of tax, and absorbs £134,130. The

balance of £5,188 falls to be added to the amount of £24,494 brought forward, and £29,680 is carried forward.

Agreed Charges.—Additional applications for the approval of agreed charges to the number of 46 have been made to the Railway Rates Tribunal under the provisions of Section 37 of the Road & Rail Traffic Act, 1933. Notices of objection must be filed with the Deputy Registrar of the tribunal at Wellington House, 125-130, Strand, London, on or before February 13.

Grand Canal Company.—The final dividend for the year 1944 on the ordinary shares of the Grand Canal Company, which owns 208 miles of waterway, from Dublin to Ballinasloe and St. Mullins with branches, is 2½ per cent. (2½ per cent.), making, with the interim of 2 per cent. (1 per cent.), 4½ per cent. for the year, against 3½ per cent. for 1943. For the year 1939 the dividend was 1½ per cent.; for each of the years 1940 and 1941 it was 1½ per cent. and for 1942 it was 2½ per cent.

National Scheme to Prevent Blindness.—The National Institute for the Blind has opened a campaign to raise a central fund to establish ophthalmic research centres in London, Oxford, Manchester, and Leeds for the prevention of blindness. It is intended to attach the centres to universities with hospital facilities. During the past year £100,000 has been raised, mostly from industry, as the result of the Oxford University ophthalmic appeal.

L.M.S.R. Dividends.—It was announced by the London Midland & Scottish Railway Company on Wednesday last that the net revenue of the company for the year 1944 was £15,679,000, a decrease of £7,000 as compared with the total net revenue for 1943. After setting aside the sum of £400,000 for war-time contingencies and with the addition of £87,000 brought forward from 1943, there is a total of £15,366,000 available for interest on debenture stocks and dividends on other stocks. The board has decided to recommend the following dividends to be paid on March 14 and to carry forward £72,000 to 1945: On the 4 per cent. guaranteed stock, 4 per cent. preference stock, and 4 per cent. preference stock (1923), at £2 per cent. actual less tax, making, with the interim payment, £4 per cent. for 1944; on the ordinary stock at £2 10s. per cent. for the year. This is the same as for 1943.

Associated Road Operators.—At an extraordinary general meeting of Associated Road Operators Limited (by Guarantee) held on December 14 last at Livingstone Hall, 42, Broadway, Westminster, S.W.1, special resolutions were passed. They provide *inter alia* that the £3,337 at present standing to the credit of the pensions fund of the company be paid over to the new pensions fund of the National Road Transport Federation as the company's proportion to such new fund, and to be used to provide for the past service of the company's employees at December 19, 1944; that the company be wound up voluntarily, that Mr. David Richardson, and Mr. Reginald Hindley, Accountant, be appointed Joint Liquidators to act with a committee of inspection consisting of Mr. Eric Roy Taylor, Mr. Willoughby Gervase Cooper, Mr. John Alexander Millar Bright (of Onward Road Transport, Selby), Mr. Stephen Smith Robson, and Mr. William Showler (of Express Omnibus Company, Gillingham, Co. Durham); that any property of the company remaining after satisfaction of its debts and liabilities be trans-

ferred in the proportions of 60 per cent. to Road Haulage Association Limited, of 20 per cent. to Traders' Road Transport Association Limited, and of 20 per cent. to Passenger Vehicle Operators Association Limited.

Argentine Railway Difficulties.—An illustration of the difficulties under which the transport systems of Argentina are operating is provided by recently-published statistics, quoted by Reuters from Buenos Aires, showing that the State Railways alone

British and Irish Railway Stocks and Shares

Stocks	Highest 1944	Lowest 1944	Prices	
			Feb. 6, 1945	Rise/ Fall
G.W.R.				
Cons. Ord.	62½	55	58½	— ½
5% Con. Pref.	122½	114½	120½	— 2
5% Red. Pref. (1950) ..	110½	104	106	+ 1
5% Rt. Charge	135½	128	134½	—
5% Cons. Guar.	134½	125	133½	—
4% Deb.	118½	112½	116½	—
4½% Deb.	118½	114	118½	—
4½% Deb.	124½	119½	122½	—
5% Deb.	137	129½	136½	—
2½% Deb.	77	73½	75½	+ 1
L.M.S.R.				
Ord.	34½	27½	30½	— ½
4% Pref. (1923)	64½	55½	62	— ½
4% Pref.	81	72½	79½	—
5% Red. Pref. (1955) ..	105½	102	102	— 2
4% Guar.	107½	99½	105½	—
4% Deb.	111½	104	107½	— ½
5% Red. Deb. (1952) ..	111	108	108½	—
L.N.E.R.				
5% Pref. Ord.	10½	7½	8½	—
Def. Ord.	5½	3½	4	—
4% First Pref.	63½	55½	60	—
4% Second Pref.	35½	28½	31	— ½
5% Red. Pref. (1955) ..	102½	97½	102	—
4% First Guar.	105½	96½	103	—
4% Second Guar.	95½	88½	94½	—
3% Deb.	88½	80½	86	—
4% Deb.	110½	103½	107	—
5% Red. Deb. (1947) ..	105½	101½	102½	—
4½% Sinking Fund Red. Deb.	107	104½	104½	—
SOUTHERN				
Pref. Ord.	80½	71½	78	—
Def. Ord.	26½	23	26	—
5% Pref.	122	113½	119½	—
5% Red. Pref. (1964) ..	117½	112½	115½	—
5% Guar. Pref.	134	125½	133½	—
5% Red. Guar. Pref. (1957)	115½	112½	115½	—
4% Deb.	118	110	115½	—
5% Deb.	135½	127	134	+ 1
4% Red. Deb. (1962- 67)	111½	107½	109½	+ 1
4% Red. Deb. (1970- 80)	112	108½	109½	—
FORTH BRIDGE				
4% Deb.	107	103	105	—
4% Guar.	106½	102	105	—
L.P.T.B.				
4½% "A"	125	119	122½	—
5% "A"	133½	128	132½	—
3% Guar. (1967-72) ..	99½	98	99	—
5% "B"	124½	118½	123½	—
5% "C"	72½	64½	69	—
MERSEY				
Ord.	35½	03	36	—
3% Perp. Pref.	72	66	70	—
4% Perp. Deb.	105	103	107	—
3% Perp. Deb.	85½	79½	84	—
IRELAND*				
BELFAST & C.D.				
Ord.	9	6	6½	— ½
G. NORTHERN				
Ord.	33½	19	27½xd	— 3½
Pref.	49	37	45½xd	— 3½
Guar.	70	57½	70	—
Deb.	90½	81½	92	—
IRISH TRANSPORT				
Common	—	—	66½	+ 1½
3% Deb.	—	—	98½	—

* Latest available quotation

have on their books 150,000, unsatisfied requests for goods wagons, representing 3,000,000 tons of goods awaiting transport.

Esher Collision Inquiry.—The Ministry of War Transport inquiry into the collision which occurred at Esher Station, Southern Railway, on the evening of January 28, was commenced at Charing Cross Hotel on February 7.

"Punjab Mail" Derailment.—Reuters reports from New Delhi that the official inquiry into the derailment of the locomotive and seven coaches of No. 6 Down, "Punjab Mail," west of Karisath Station, on the East Indian Railway, on November 23 last has shown that the derailment was caused by the deliberate removal of a rail from the track. A message from our correspondent in India states that a reward of Rs. 5,000 has been offered to anyone giving information leading to the detection and arrest of persons responsible for the derailment. The offer, which is announced by the Government of Bihar, is open for six months. Reference to the occurrence was made in our January 12 issue.

Commercial Motor Users Association.—At an extraordinary general meeting of the Commercial Motor Users Association (Incorporated), held on January 10 at the Savoy Hotel, Westminster, London, special resolutions were passed providing for the voluntary winding-up of the association and for the appointment of Mr. William Alexander Winson, of 146, New Bond Street, London, W.1, as liquidator. The resolutions also provided for the appointment of a committee to determine the proportions of the property of the Commercial Motor Users Association to be transferred to the following organisations: the Road Haulage Association Limited by Guarantee, the Traders Road Transport

Association Limited by Guarantee, and the Passenger Vehicle Operators Association Limited by Guarantee.

Carter Paterson & Co. Ltd. Office Address.—Carter Paterson & Co. Ltd. has given up its evacuation offices at Codicote Lodge, near Hitchin, Hertfordshire, and the staff has returned to the registered office, 128, Goswell Road, London, E.C.1.

Railway Disaster in Mexico.—It is reported that well over 100 persons were killed in a railway accident which occurred in the province of Queretaro, Mexico, on February 1. Most of the victims, it is stated, were travelling to a festival at San Juan de Los Lagos in two special trains, one of which ran into the other while it was standing in Cazadero Station.

Two Coaches Derailed outside Kings Cross.—It is reported that two persons were killed, and about 25 injured, in a railway accident outside Kings Cross Station, L.N.E.R., on February 4. An official statement issued by the L.N.E.R. said: "The 6 p.m. train to Leeds and Bradford had entered the tunnel outside the station when, for some reason at present unknown, it started to move backwards. Two rear coaches became derailed, one falling over on its side."

Railway Air Services.—Mr. O. H. Corble, Assistant General Manager of the L.N.E.R., speaking of air travel in Great Britain after the war, told the Hackney Rotarians on January 30: "A lot of planning has to be done in connection with the resiting of our airports. How long will London be content with Croydon, which is half an hour from Victoria? Not very long. Air travel will not be cheap. Many persons have the idea that post-war

air services will have a speed of about 500 m.p.h. They are mistaken; we aim at an economic safe speed of about 200 m.p.h. We want frequency of service with a small type of aircraft."

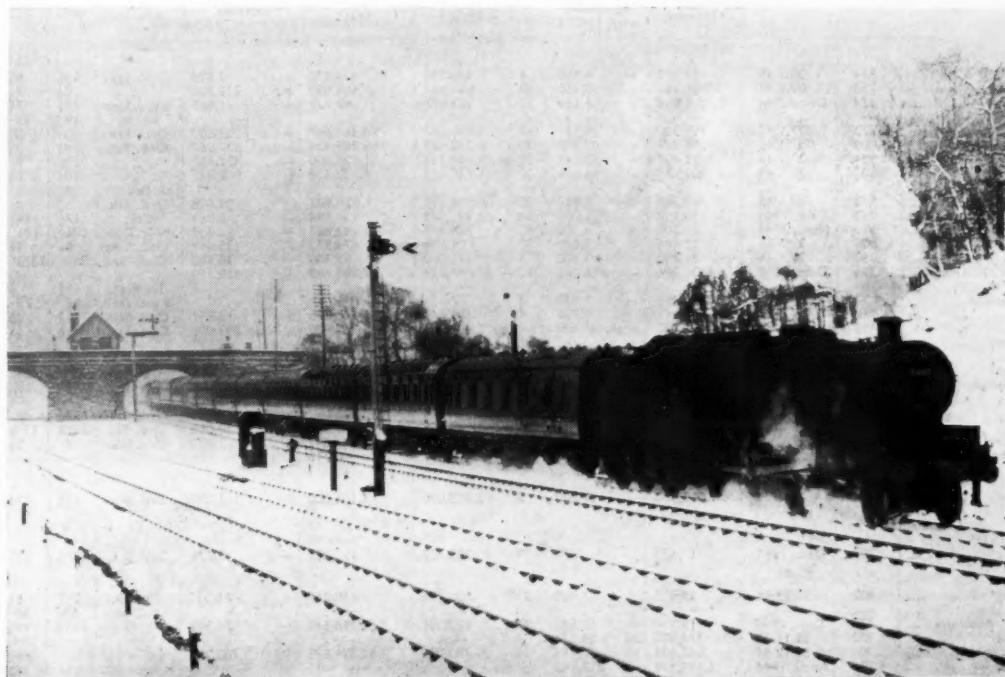
Contracts and Tenders

It is reported that Major N. de Alencastro Guimaraes, General Manager of the Central Railway of Brazil, who recently visited the United Kingdom to place orders for electrification and other railway equipment, has arranged large purchases from British manufacturers. Major Guimaraes is stated to have said that, from everything he had seen and discussed, he had formed the opinion that there was a good prospect of trade between Great Britain and Brazil being greatly increased.

Below is a list of orders recently placed by the Egyptian State Railways:—

Benjamin Electric Limited: Saalflux.
Venus Pencil Co. Ltd.: Stationery articles.
Herbert Morris Limited: Spares for Gabbary Power House.
Marryat & Scott Limited: Spares for Gabbary Power House.
Superheater Co. Ltd.: Flame tubes, smoke tubes and superheater elements.
British Thomson-Houston Co. Ltd.: Relay contacts.
Richard Klinger Limited: Packing sleeves.
Norton Grinding Wheel Co. Ltd.: Grinding wheel segments.
Morgan Crucible Co. Ltd.: Carbon brushes.
P. & W. MacLellan Limited: Steel bands.
Urquhart Lindsay & Robertson Orchard Limited: Fibre washers.
Clyde Crane & Engineering Co. Ltd.: Spares for Gabbary Power House.
W. Ridgway & Sons Ltd.: Auger steel hand.
Siemens Electric Lamps & Supplies Limited: Electric hand lamps.

A Wintry Scene



A view at Milehouses Bank, Sheffield, during the recent wintry weather. Some of the difficulties with which the railways had to contend were mentioned in an editorial article in our January 26 issue

Railway Stock Market

Although only moderately active, stock markets have been steadier, with British Funds again a firm feature aided by increased demand for $1\frac{1}{2}$ per cent. Exchequer Bonds, and also by dealings in New Zealand $3\frac{1}{2}$ per cent. stock at a slightly higher premium than generally had been expected. Home rails were affected more by the surrounding trend of markets than by dividend and yield considerations, and earlier gains were not held; the disposition earlier in the week had been to await the L.M.S.R. dividend statement. Although junior stocks were easier after an earlier improvement, prior charge stocks kept firm in sympathy with gilt-edged. Yields of over $3\frac{1}{2}$ per cent. are still obtainable on Great Western and Southern 4 per cent. debentures, which are not unattractive when compared with yields on many other high-class investments.

The dividend statements are almost bound to draw attention to the large yields on home rail junior stocks, but whether this will attract demand will probably turn mainly on the general tendency of markets.

Moreover, there is an increased disposition this year to await the annual meetings for any statements as to views of the directors on the problems and outlook for the post-war period. L.N.E.R. 4 per cent. second preference, which for 1943 received a dividend of $2\frac{1}{2}$ per cent., yields as much as $8\frac{1}{2}$ per cent., or more than the return on L.M.S.R. ordinary and other junior stocks. This dividend compared with $2\frac{1}{2}$ per cent. for 1942, and was helped by

profits on investments, although it should not, of course, be overlooked that the prudent and conservative policy of placing £200,000 to contingencies reserve was repeated. The large yield on L.N.E.R. second preference is due to slight doubts whether the dividend will remain on a $2\frac{1}{2}$ per cent. basis throughout the period of control, although it is generally expected this rate will be repeated for the past year. On the other hand, it is contended that the increase to $2\frac{1}{2}$ per cent. would not have been made unless there were reasonable possibilities of it being maintained so long as the fixed rental is in force. According to current views, L.M.S.R. is the only junior stock with possibilities of a slightly higher payment, but this will turn on whether it is considered necessary during the control to maintain the annual contingency allocation of £400,000. It may be recalled that in respect of 1943 the raising of the dividend on Southern deferred from $1\frac{1}{2}$ per cent. to 2 per cent. came as surprise. Despite the annual rental being fixed, total income may show slight adjustments from year to year, and there are, of course, fluctuations in income from sources not included in the control agreement, such as profits on investment sales, etc.

Great Western reacted to $58\frac{1}{2}$, compared with 59 a week ago, but the 5 per cent. preference was maintained at 120, the guaranteed stock at 134, and the 4 per cent. debentures at 116. L.M.S.R. lost an earlier gain, reacting to 31, compared with $31\frac{1}{2}$ a week ago, although the senior preference strengthened from $79\frac{1}{2}$ to $79\frac{3}{4}$,

and the 1923 preference at 62 was unchanged on balance. L.N.E.R. second guaranteed was unchanged at $94\frac{1}{2}$, as was the first preference at $59\frac{1}{2}$; but the second preference reacted slightly from $31\frac{1}{2}$ to 31. Among Southern stocks, the 5 per cent. preference kept at 120, but the preferred ordinary was $\frac{1}{2}$ down at $77\frac{1}{2}$, although the deferred at $25\frac{1}{2}$ was unchanged as compared with a week ago. London Transport "C" was maintained at $69\frac{1}{2}$, the small yield in this case reflecting the expectation of improved dividends after the war when control is ended.

After a rally, aided by satisfaction with the debenture interest payments announced by B.A. & Pacific and Argentine Great Western, Argentine rails turned dull again. There has also been talk of a fuel deal with the U.S.A. which might ease the fuel difficulties of the railways. Post-war hopes also induced some buying of Argentine rails. It was found, however, that many of the debentures are not in large supply, and that consequently prices are liable to sharp adjustments when demand improves. Although best levels were not held, B.A. Great Southern was $11\frac{1}{2}$, compared with 11 a week ago, the 5 per cent. preference $26\frac{1}{2}$, compared with $24\frac{1}{2}$, and the 4 per cent. debentures $60\frac{1}{2}$, compared with 59. B.A. & Pacific $4\frac{1}{2}$ per cent. consolidated debentures were $55\frac{1}{2}$ and the 1912 debentures 25, with Argentine Great Western 5 per cent. debentures $57\frac{1}{2}$. Elsewhere, San Paulo ordinary improved from 59 to 60. Canadian Pacifics have been active pending the dividend decision, rising from $14\frac{1}{2}$ to $15\frac{1}{2}$.

Traffic Table and Stock Prices of Overseas and Foreign Railways

Railways	Miles open	Week ended	Traffic for week		No. of Weeks	Aggregate traffic to date			Shares of stock	Prices						
			Total this year	Inc. or dec. compared with 1942/3		Totals		Increase or decrease		Highest 1944	Lowest 1944	February 6, 1945	Yield % (See Note)			
						1943/4	1942/3									
			£	£		£	£	£								
Antofagasta (Chili) & Bolivia	834	28.1.45	33,200	+	4,960	4	126,190	124,670	+	1,520	Ord. Stk.	13½	9½	10	Nil	
Argentine North Eastern	753	27.1.45	20,767	+	3,360	30	595,527	484,820	+	110,707		6½	4½	6½	Nil	
Bolivar	174	Dec., 1944	5,945	+	1,169	52	63,997	62,732	+	1,265	6 p.c. Deb.	18½	7½	7½	Nil	
Brazil	...	...	...	...	...	...	...	...	...	...	Bonds	19½	15	18	Nil	
Buenos Ayres & Pacific	2,773	27.1.45	159,205	+	25,533	30	4,095,267	3,362,667	+	732,600	Ord. Stk.	7½	3½	5½	Nil	
Buenos Ayres Great Southern	5,080	27.1.45	295,467	+	63,200	30	6,292,467	5,765,400	+	527,067	Ord. Stk.	14½	9½	11	Nil	
Buenos Ayres Western	1,924	27.1.45	72,400	—	£2,133	30	2,234,733	1,813,600	+	421,133	"	13½	9½	10½	Nil	
Central Argentine ^a	3,700	27.1.45	202,283	+	16,030	30	5,728,053	4,922,736	+	805,317	"	10½	6½	8½	Nil	
Do.	...	...	...	...	...	...	...	...	...	...	Dfd.	4½	3	5	Nil	
Cent. Uruguay of M. Video	972	27.1.45	38,322	+	3,993	30	996,359	1,024,987	—	28,628	Ord. Stk.	5½	4	5	Nil	
Costa Rica	262	Dec., 1944	10,108	—	5,700	26	121,331	130,194	—	8,863	Stk.	17½	14½	16	Nil	
Dorada	70	Nov., 1944	29,500	+	4,500	47	294,943	243,607	+	51,336	1 Mt. Deb.	101	101	98½	£6 1/10	
Entre Rios	808	27.1.45	27,486	+	3,820	30	789,640	674,573	+	115,067	Ord. Stk.	6½	4½	5	Nil	
Great Western of Brazil	1,030	27.1.45	31,100	+	7,100	4	112,000	95,300	+	16,700	Ord. Sh.	38½	23½	30½	Nil	
International of Cl. Amer.	794	Dec., 1944	\$620,306	—	\$76,062	52	\$7,447,799	\$7,285,649	+	\$162,150	"	—	—	—	Nil	
Interoceanic of Mexico	...	...	...	...	...	...	...	...	...	...	1st Pref.	1½	1	1	Nil	
La Guaira & Caracas...	22½	Jan., 1945	5,494	—	1,146	4	—	—	—	—	5 p.c. Deb.	88	79	79½	£6 5/9	
Leopoldina	1,918	27.1.45	46,043	—	1,736	4	181,842	168,095	+	13,747	Ord. Stk.	5½	4½	4½	Nil	
Mexican	483	31.1.45	ps. 1,058,800	+	ps. 441,600	4	ps. 2,600,800	ps. 1,703,800	+	ps. 897,000	Ord. Stk.	4	4	4	Nil	
Midland Uruguay	319	Dec., 1944	15,817	—	3,197	26	99,688	103,465	—	3,777	"	—	—	—	Nil	
Nitrato	382	15.1.45	6,644	+	1,206	2	6,644	5,438	+	1,206	Ord. Sh.	75/10	65/10	70½	£3 1/10	
Paraguay Central	274	26.1.45	£30,890	—	£13,162	30	£1,790,473	£1,600,999	+	£189,474	Pr. Li. Stk.	79½	68	77	£7 16/3	
Peruvian Corporation	1,059	Jan., 1945	145,653	+	34,209	30	914,951	748,631	+	166,320	Pref.	9	10	9½	Nil	
Salvador	100	Dec., 1944	c 148,000	—	c 26,000	26	c 558,000	c 603,000	—	c 45,000	"	—	—	—	Nil	
San Paulo	153½	—	—	—	—	—	—	—	—	—	Ord. Stk.	57½	46	59	£3 7/10	
Talait	1301	Dec., 1944	2,390	—	5,335	26	15,165	35,225	—	20,060	Ord. Sh.	21½	13½	12½	Nil	
United of Havana	1,301	27.1.45	54,443	—	12,370	30	1,450,035	1,447,042	+	2,993	Ord. Stk.	4	2½	3	Nil	
Uruguay Northern	73	Dec., 1944	1,568	—	17	26	8,892	8,716	+	176	"	—	—	—	Nil	
Canada																
Canadian Pacific	17,028	21.1.45	1,092,400	—	17,800	3	2,973,000	3,104,800	—	131,800	Ord. Stk.	17½	13½	14½	6½	
India																
Barri Light	202	Dec., 1944	17,475	—	570	39	203,107	191,332	+	11,775	Ord. Stk.	129½	97½	127½	£3 10/7	
Various																
Egyptian Delta	607	31.12.44	23,417	+	1,488	39	528,174	439,257	+	88,917	Prf. Sh.	7½	5½	7	Nil	
Manila	...	...	...	...	...	...	...	...	...	...	B. Deb.	63½	58	60	Nil	
Midland of W. Australia	277	Dec., 1944	19,294	—	11,545	26	120,301	196,643	—	76,342	Inc. Deb.	101½	99½	98½	£4 1/3	
Nigerian	1,900	25.11.44	374,576	—	59,634	4	—	—	—	—	"	—	—	—	Nil	
South Africa	13,301	30.12.44	842,501	+	75,453	39	35,783,075	32,599,873	+	3,183,202	"	—	—	—	Nil	
Victoria	4,774	April, 1944	1,188,999	—	212,162	—	—	—	—	—	"	—	—	—	Nil	

Note. Yields are based on the approximate current price and are within a fraction of $\frac{1}{4}$ per cent. Argentine traffic is given in sterling calculated @ 15 pesos to the £
† Receipts are calculated @ 1s. 6d. to the rupee